DOCUMENT RESUME

ED 198 680 EC 132 407

TITLE A Plan to Develop a Training Program for Pediatricians in the Care of Children with Educational Handicaps. Final Performance Report. Revised.
INSTITUTION Children's Hospital Medical Center, Boston, Mass.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
BUREAU NO 451BH80067
PUB DATE Jun 80
GRANT G007603476
NOTE 105p.

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Curriculum Development; *Disabilities; Elementary Secondary Education; *Fellowships; *Inservice Education; Needs Assessment; *Pediatrics; Physicians; Preschool Education; *Professional Training; *Program Development

ABSTRACT

The document presents the final report of a 3 year project to assess and respond to gaps in primary physicians' knowledge of child development in general and handicapping conditions in particular. In an introductory section it is explained that a minifellowship program was developed which offered sessions in the following areas: clinical procedures; speech and language evaluation; audiological evaluation; diagnosis of specific learning disabilities in the school age child; issues of attention and activity in the school age child; evaluation and management of developmental problems in adolescence; developmental issues and assessment and management of developmental problems in the preschool years; management of developmental problems and assessment of problems in infants and toddlers; evaluation and management of the multihandicapped child; evaluation and management of the child with hearing impairment; discipline, management, and counseling issues; and pediatric roles in the management of developmental problems. Cited among findings of a needs assessment survey involving 97 pediatricians was that pediatricians did not view practical experience as an adequate substitute for formal training in developmental assessment skills. It is explained in Section III that the minifellowship curriculum design contained five major sections: a general overview of development, developmental assessment, and pediatric roles in intervention and management; the infant/toddler years in terms of cognitive development, language development, motor development, temperament, social-emotional development, sensory impairments, and early intervention; the preschool years including sensory perceptual development and preschool assessment; the school age years adding the subjects of learning disorders and hyperactivity; and adolescent development and behavior. Evaluations of part time fellowship participants are presented in Section IV. A final section identifies three fundamental prototypes of pediatricians requiring individualized preparation--the primary care physician who is a community based generalist for whom developmental pediatrics is one of the large number of subspecialty areas with which he must be familiar; the pediatrician who is a generalist in primary care practice but who has a special interest in the handicapped child and in developmental pediatrics; and those fully involved in the care of handicapped children. (SBH)

ED198680

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FINAL PERFORMANCE REPORT:

A PLAN TO DEVELOP A TRAINING PROGRAM FOR PEDIATRICIANS IN THE CARE OF CHILDREN WITH EDUCATIONAL HANDICAPS

Nos. G007603476 451BH80067 June 1980 (Revised)

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I. INTRODUCTION

In June 1976 a three-year effort to assess and respond to gaps in primary physicians' knowledge of child development in general and handicapping conditions in particular was begun at The Children's Hospital Medical Center, Boston. Funding from the Bureau of Education for the Handicapped (BEH) supported a research fellow, a staff pediatrician, a special educator, and an administrative assistant. In addition, guidance was provided by a volunteer board of advisors which included the directors of several relevant services (hearing and speech, neurology, mental retardation, etc.) at the hospital. The project's focus was on the needs of pediatricians and family physicians already in practice. These health care professionals were experiencing increasing demands from parents and from schools to participate more fully in the assessment and management of children experiencing educational failure. To meet the physician's own expressed desire for more expertise in developmental and behavioral pediatrics, the investigators decided to document training needs and respond to these by establishing a "mini-fellowship" in developmental pediatrics at The Children's Hospital Medical Center.

The foundation of the training program was a literature review conducted by Drs. Paul Dworkin and Jack Shonkoff in the first year of the project. Using the facilities of the Harvard Medical School library, they researched American, Canadian, and British literature

in child and adolescent development. Areas covered included cognition, neuromotor ability, temperament, social-emotional development, language, sensory impairment, and the issue of early intervention. Learning disorders and "hyperactivity" were also studied. Concurrent with this curricular research, the subject of pediatric training itself was investigated.

These reviews of the subject matter of developmental pediatrics and physician training led to the construction of a questionnaire that was administered by Drs. Dworkin and Shonkoff to 97 randomly selected New England pediatricians who were spending at least 75% of their professional time in the delivery of primary care. The results of this research were reported in two articles (Dworkin et al: Training in Developmental Pediatrics, Am. J. Dis. Child. 133, July 1979; Shonkoff et al: Primary Care Approaches to Developmental Disabilities, Pediatrics 64:4, October 1979). It was found that formal training in development was rated as inadequate by 79% of the respondents. In this subject area, residencies were viewed as highly valuable by only 30%, and 47% rated medical school as having no value. Nearly all the respondents said that clinical experience was a valuable source of knowledge, but two-thirds did not regard it as an adequate substitute for formal training. Ninety-seven percent of the physicians indicated a part-time longitudinal clinical experience as their first choice for further education in development. As to the ways in which developmental and educational problems were being seen in the respondents' offices, the majority relied exclusively on clinical

judgment and general observations for assessing developmental problems in their offices. Responsibility for preschool screening for potential learning problems and the assessment of school failure were considered appropriate pediatric concerns.

With the needs assessment completed, plans began for the design of a "mini-fellowship" curriculum. The project's special educator, Dr. Terrell Clark, added insights from her field in the design of the program. In particular, she assisted in the annotation of an extensive bibliography and a list of evaluative instruments. During this time, assessment tools developed by Dr. Melvin D. Levine, the principal investigator, were used in a series of teaching videotapes intended to demonstrate to practicing physicians the neurodevelopmental components of educational performance. Films were made of children with language problems, behavioral problems, and "hyperactivity". Settings included home, school, and the doctor's office.

In April of 1978, during the construction of the "mini-fellowship" curriculum, a national symposium was held in Gloucester to discuss the preparation of physicians for handicapped children (Levine and Maroney, Eds: Preparing Physicians for Handicapped Children: Report from an Interdisciplinary National Symposium on Training in Developmental Pediatrics). Sixty-five professionals representing a variety of disciplines met to study pediatric education in the traditionally under-emphasized area of development. The group was charged with the formidable tasks of analyzing the current

status of physician training and developing guidelines for future models. Study groups addressed the hearing impaired and language disabled child, the multiply handicapped child, early pediatric screening and detection, the learning disabled child, and behavior disorders affecting learning.

The participants did not create a precise "job description" for the physician dealing with a child with educationally relevant handicaps in all areas of disability. Although some groups were able to achieve a consensus in their design of a pediatric role, major questions remained for others regarding the extent of pediatric involvement in diagnosis, management, follow-up, and advocacy. For some, the goals for professional preparation were clear. Others felt that specific curriculum quidelines should await the resolution of fundamental differences regarding a number of alternative models. The participants agreed that training in developmental pediatrics needed to conform to the resources, personnel and philosophical perspective of individual departments of pediatrics, but nevertheless called for the setting of general objectives and formats.

With the basic didactic format in place, contacts were made throughout Children's Hospital Medical Center with colleagues in related disciplines who were interested in training practicing physicians. Training sites were established in the Developmental Evaluation Clinic (a university affiliated facility), in the Speech and Hearing Department, and in other programs.

A training center was also established in the Melrose, Massachusetts public schools. Melrose, a community of 30,000, had identified under the Massachusetts 766 program approximately 650 children as having special needs. The training program was designed to demonstrate various classroom settings to the physician trainees. These included regular classrooms, a preschool class for children at risk and "normal" children, and a number of substantially separate classrooms including one for children with severe to moderate developmental disabilities. It was thought that the mini-fellows and a physician on the staff of the project would, during each visit, participate in the evaluation of a child referred to them by the school system.

At last, the components of the "mini-fellowship" were in place. Invitations to participate in a nine-week (two days per week) program were sent to pediatricians and family practitioners in the Greater Boston area. Six hundred and six invitations were sent, and nine (7 pediatricians, 2 family practitioners) of the respondents were selected. In the last year of the grant, eight "mini-fellows" were trained (one candidate having dropped out due to problems obtaining coverage for his practice). Each was given a pre- and post-test to assess knowledge of developmental pediatrics. Subjects covered in didactic sessions included:

1. clinical procedures
2. speech and language evaluation
3. audiological evaluation
4. diagnosis of specific learning disabilities in the school age child

5. issues of attention and activity in the school age child
6. evaluation and management of developmental problems in adolescence
7. developmental issues and assessment and management of developmental problems in the preschool years
8. management of developmental problems and assessment of problems in infants and toddlers
9. evaluation and management of the multihandicapped child
10. evaluation and management of the child with hearing impairment
11. discipline, management, and counselling issues
12. an overview of pediatric roles in the management of developmental problems (presented by a physician in practice with a significant interest in the field of developmental pediatrics)

In general, the "mini-fellows" were quite pleased with the training presented to them. One of the physicians taking the course was the newly elected president of the Massachusetts chapter of the American Academy of Family Physicians. Those fellows whose goals were well formed before entry into the program usually found the training most rewarding. Their ages ranged from the thirties to the sixties.

In the project's third year, Mr. William Twarog joined the staff as Resource Coordinator. Working at the offices of the American Academy of Pediatrics (AAP) during the first months of his tenure, he began an investigation of the medical implications of P.L. 94-142 for state education laws. His report was published and distributed to AAP chapter chairmen.

Before the training program moved into its second year, and the first year of a new training grant from the Bureau of Education for the Handicapped, another national symposium was held in Boston. This meeting of professionals from related disciplines was designed

to deal with the gulf between health care and education. As Dr. Levine stated in his introduction to the proceedings of this symposium (Levine et al: Child Health and Education: The Relevant Questions), "The exchange of information between education and medicine has been deficient. A multitude of relevant issues arise. What are the most appropriate questions for educators to ask physicians about a child? What questions should a health provider pose to a school about a patient? Which questions will yield the most useful information? How can one classify or group these questions meaningfully? Are there certain kinds of questions that are most likely to lead to misunderstandings or to widen the gulf between disciplines? "

Educators, psychologists, physicians, speech and language experts, nurses and professionals from a number of other disciplines were divided among six groups or problem areas: learning disabilities, behavior disorders associated with learning difficulty, neurological and motor problems, visual deficits, disorders of hearing and language, and retardation and the multiply handicapped child. From the discussions of these groups was drawn a non-categorically based system of relevant questions arranged in twelve areas that transcend the categories of specific handicap. Part 1 of the proceedings dealt with questions that school personnel might want to ask physicians or other health care providers and Part 2 surveyed questions that physicians might ask schools. A summary of the specific questions in the form of a checklist was included.

Thus, the perceived need to address gaps in pediatric training in development and behavior had been met through the design of a training program grounded in a needs assessment of the potential trainees themselves. The following pages will provide more detail as to the design of the fellowship, its first year of existence, and its outcome.

II. NEEDS ASSESSMENT

What Haggarty has called the "new morbidity" began to affect outpatient clinics at The Children's Hospital Medical Center in the early 1970's. The most common complaints shifted from fevers of unknown origin, recurrent infections, and allergies to "hyperactivity". In the community surrounding Boston, physicians were called upon increasingly by parents and schools to assess and manage children with educational handicaps. Medical professionals were being asked to arbitrate complex cases of school failure.

By virtue of the physician's unique involvement with the family's welfare, he or she is well qualified to act in the role of manager for a child's educational well-being; yet few physicians are trained for this responsibility. Traditional pediatric curriculae offer little information about child development and even less about education. Thus, the practicing physician, the doctor who has been in the field for a number of years and who is being called on to act by parents and schools was thought to be in need of intensive training. This gap in training was known to the pediatricians themselves. At Children's Hospital, several had volunteered to work once a month in the School Function Program, a multi-disciplinary clinic which evaluates children who are failing in school.

To validate this apparent need, Drs. Shonkoff and Dworkin conducted a review of literature relevant to child development. In their report, they noted that "confusion exists in the pediatric

literature with regard to the use of the term 'child development'. At various times it has included issues ranging from child rearing practices and the common problems of normal children to the implications of such diverse conditions as mental retardation, learning disabilities, emotional disorders, cerebral palsy, and other physical or sensory handicaps. Issues of child development have alternatively been subsumed under the categories of 'behavioral', 'social', and 'developmental' pediatrics."

They did not fail to recognize the critics of the physician's role in this field, reporting that "the unproven efficacy of early identification and intervention for many developmental problems, the lack of proper assessment tools and knowledge concerning frequency and developmental stages when they should be employed, lack of appropriate skills and training on the part of the pediatrician, insufficient time to deal with developmental problems in a busy office practice and inability or unwillingness to charge appropriate fees for the time required to deal with such problems, and the possibility that, at least with regard to assessment, well-instructed paramedical personnel may do a more satisfactory job than an harrassed or uninterested doctor, are presented as arguments against extensive pediatric involvement".

One answer to these criticisms was clearly further training in child development for physicians already in practice. The researchers identified four areas worthy of investigation:

1. How many children with developmental problems and educational handicaps are pediatricians seeing in their practices?
2. How do pediatricians presently identify, evaluate, and manage children with developmental problems and educational handicaps?
3. How frequently do pediatricians utilize available referrals and/or consultations for their patients with developmental problems and educational handicaps?
4. What are pediatricians' attitudes concerning their role in the management of children with developmental problems and educational handicaps?

Numerous studies have identified the frequency of various developmental problems in the general population. For example, an estimated 10 to 30% of children experience significant learning problems on behavioral difficulties manifested in poor school performance. Twenty to thirty percent of children entering first grade are said to have emotional problems, and 3% of the population is described as being mentally retarded. In an English study, approximately 1% of births produced children with severe or moderate developmental handicaps, and an estimated 5% of children in regular schools suffer from what are termed "neurodevelopmental disorders of childhood". Prevalence of cerebral palsy is estimated to be 2.9 per 1,000.

In contrast, limited information is available concerning the frequency of developmental problems presenting in pediatric practice. Many doctors have commented on the frequency with which pediatricians are seeing children with problems related to school performance, behavior, speech development, hearing and vision, emotional

difficulty, and other "developmental" areas. Statistical documentation for such observation is limited, however. Many investigations report that 30 to 50% of pediatric practice is concerned with "well-child care" and child health supervision. These studies fail to define well-child care, however, and the extent to which behavior, emotional problems, school problems, and other developmental issues are included cannot be determined. In the few studies providing statistical information, behavioral problems are estimated to be addressed in as few as 2% to as many as 70% of office visits. In a study observing four pediatricians, Bergman noted that during a well-child visit school performance was discussed during 17% of such visits, and that developmental issues occupied 35% of history time, with behavioral issues occupying 25%. A Michigan survey estimated that the pediatrician saw a median number of 50 children per year with school problems and 10 retarded children per year. Thus, very limited information is available concerning the frequency with which pediatricians are being called upon to address the needs of children with developmental problems, and that which has been presented is confusing and contradictory. A major difficulty encountered in compiling such information is the accepted definitions of various developmental problems; what is for one observer a developmental delay may be for another interpreted as a variant of normal and not viewed as a problem.

Studies dealing with analysis of the content of pediatric practice have employed various methods. The pediatrician can

record all diagnoses of patients seen in a convenient manner and subsequently analyze the data. This method affords the opportunity of a prospective study; however, the pediatrician must be sufficiently interested and motivated to maintain accurate records. An alternative approach is a retrospective review of physicians' records. The variability of completeness of such records would preclude this method of assessing frequency of problems as varied in nature as those dealing with development. Another approach is the direct observation of pediatricians in practice. The observer can record the frequency of various problems and time spent dealing with such problems. Difficulties with this approach, however, include the inherent time and manpower demands as well as controlling for the effect which the presence of the observer would have on the activities of the practitioner.

Investigators have also employed the technique of physician questionnaires to accumulate frequency data. Several studies have utilized the mail survey with success, including that directed by the Subcommittee on Pediatric Manpower of The Council on Pediatric Practice of the American Academy of Pediatrics. Although compliance on the part of the recipient is an inherent difficulty, such an approach affords the best opportunity for achieving a large sample size. Data from the latter survey did tend to agree with the results of studies utilizing direct observation. Such questionnaires could request of the physician specific data regarding frequency, or

request a rating of relative frequency of various problems.

An alternative to the mail survey which also employs the technique of physician questionnaires is the interview. This approach consumes less time than direct observation and alleviates the compliance problem of the mail survey. This method has been successful in the past, and the ability of the physician to relate the average number of children with various disorders seen in a year compares favorably to population surveys of prevalence.

Thus, documentation of the frequency with which pediatricians are seeing children with specific developmental problems was seen as limited. In an attempt to provide such data, the physicians proposed to interview a group of randomly selected pediatricians in New England. They selected the interview approach on the basis of its successful utilization in the past and its acceptable time and manpower demands. They realized, however, that their data would underestimate the actual number of problems, as several studies had documented the failure of the physician to take cognizance of psychosocial, behavioral, and mental problems. Despite this limitation, however, they felt that their method would provide useful information. The actual selection of the survey population was performed by an epidemiologist and a biostatistician.

Perhaps the most basic restriction faced by the investigators in this area was the absence of the universally accepted definition of the limits of "normality". Although many applaud the persistence

of ambiguity in this situation, it is nevertheless troublesome to be unable to at least identify the boundaries beyond which further investigation and intervention of any kind may be indicated in many areas of child development. When, for example, is a normally active child considered to be overactive, even "hyperactive"? At what age may a child be appropriately diagnosed as having "delayed language development"? The dangers of both false positives and false negatives have been frequently underlined; moreover, the failure to reconcile discrepancies between true sociocultural difficulties and significant deviation from well validated norms has been the object of a great deal of intense political and ethical debate. Consequently, in the absence of definite diagnostic categories it is obviously difficult to attempt to objectively evaluate the physician's ability in a number of developmental areas. The investigators noted that it would be useful nevertheless to see whether there was a consensus response among primary care pediatricians to a selective sample of clinical problems, or whether the pediatric approach was largely random and idiosyncratic. They noted that variability in clinical approach was quite common among excellent physicians. The extent of variability in the approach to developmental problems had not been previously examined.

The shortcomings of currently available developmental screening instruments imposed another limitation on the interviewers' ability to judge the quality of developmental assessment in a pediatric office setting. In 1964, Caldwell and Drachman found that two

common standardized developmental tests and a composite scale of their own creation yielded similar means for a sample of 56 infants ranging from 6 weeks to 22 months. A more recent review of 5 currently popular developmental screening inventories revealed important deficiencies with respect to limited data on reliability and validity, inadequate data on predictive validity, and norms based on small samples of children who might not be representative of other populations being screened. Moreover, the researchers found little information about the optimum frequency and developmental stages at which screening will result in maximum yield at minimum cost.

Given such fundamental limitations in the available instruments, one's ability to critique a pediatrician's screening skills is tenuous; however, the abuse of such tests is fairly widespread. In 1964, a study of members of the British Pediatric Association revealed that developmental tests were used by 132 of the 192 respondents or their associates. Of this group, however, 91% used the instruments primarily on babies thought to have developmental delays and relatively few used them on all babies as a routine. It was also found that, in more than half of the cases, physicians constructed their own battery of items selected from the available published tests, thus invalidating the standardization of their evaluations. In a survey of 5,799 pediatricians in the United States in 1970, Yankauer found that 68% of the physicians personally used

developmental tests in their practices, 8% utilized other personnel for their administration, and a full 21% performed no formal screening at all. No information was obtained about the particular tests that were selected nor how they were used.

When the investigators considered the issues of the advantages of early diagnosis and the availability of effective diagnostic and treatment resources, however, it became apparent that approaches to development delay or deviation posed serious problems. As Frankenburg noted: "if it is not possible to reverse, slow down or ameliorate the disease or the family's adverse response to the disease, there is little value to presymptomatic diagnosis for the individual involved...few people would want to know that they have a disease if they must simultaneously be told that there are insufficient funds, facilities, or personnel to take care of their problems". Controversy over the value of early intervention and over the relative merits of alternative management programs has been rampant in the field of developmental disabilities. The dearth of well-controlled studies and resultant lack of systematic data on the development of handicapped children leaves sufficient room for wide ranges of enthusiastic advocacy of specific programs as well as nihilistic skepticism of the value of any intervention beyond family counseling. In the face of such chaos, the evaluation of a pediatrician's competence in the formulating of an appropriate plan of management for a child with development problems seems unreasonable.

The physician interviewers noted that the instrument to be used in the proposed study had apparent limitations. Clearly, a pediatrician's response to a questionnaire might reflect an impression of what he or she should do or would like to be able to do rather than what, in fact, is done.

Although precise definitions of developmental dysfunctions or handicap are sometimes elusive, unquestionably reliable and valid tools for identification are not available, and alternative forms of intervention have not been adequately evaluated and proved to be effective, the researchers argued that one could assess the competence of practicing physicians in this area nevertheless. This could be done, they proposed, by carefully defining those few issues for which there is general agreement about the criteria for optimal care and building further as additional information is acquired. Two principles were selected to assess the competence of primary care pediatricians; the first involved the use of interdisciplinary evaluation and management. Although the accumulation of hard supportive data has not been achieved, it was generally accepted that optimal health care for a child with a developmental problem predisposing to education or social handicaps was dependent upon maximum utilization of available community resources in a well-coordinated, comprehensive approach. Although this may not be sufficient to ensure optimal development, it is clearly a necessary condition for adequate management. Mere documentation of interdisciplinary contact obviously does not address itself to the quality

of the interaction or to its efficacy. What could be examined, however, were the referral and consultation patterns of practicing physicians, making possible questioning of the competence of a program of management that does not utilize appropriate services. The second area in which it was decided there to establish criteria for optimal pediatric practice concerned those handicaps for which the necessity for early identification and the consequences of late intervention have been well documented. The hearing impaired child is an ideal example of the type of patient whose diagnosis and management can be objectively evaluated in these terms. With these guidelines in mind, the physician interviewers created a proposed physician interview form to be administered by them in the physicians' offices. This format was field-tested to insure standardization with the assistance of a statistical consultant.

Dr. Alan Leviton, a neuroepidemiologist at Children's Hospital and Dr. Robert Reed, a biostatistician at the Harvard School of Public Health assisted in the selection of the study population. The group to be surveyed consisted of pediatricians certified by the American Board of Pediatrics who were currently engaged in the delivery of primary pediatric service for at least 75% of their professional working hours. An updated list of all board-certified pediatricians residing within the five target states (Maine, New Hampshire, Vermont, Massachusetts and Rhode Island) was obtained from the "Directory of Medical Specialists, Marquis

Who's Who 1975-76" and from the list of the most recently certified pediatricians as published in the Journal of Pediatrics from November 1975 through 1976. Of the 1,010 eligible candidates, 267 (26%) were selected by a randomized process within geographically defined strata by each state. Introductory letters were mailed and followed by a telephone call to confirm congruence with the study criteria and to obtain agreement to participate. Of the 112 pediatricians who spent at least 75% of their professional time engaged in the delivery of primary care, 97 (87%) agreed to cooperate and were ultimately interviewed in their offices. All interviews were conducted by Drs. Dworkin and Shonkoff, who had both completed their pediatric residency programs.

Following the establishment of interobserver reliability for scoring responses during a preliminary pilot study, formal interviews were conducted beginning in December 1976 and extending into the Spring of 1977. Each session consisted of the administration of a semi-structured questionnaire that contained both objective and open-ended questions. The entire interview generally required one half hour. In several cases, a participant's elaboration on specific issues extended the session to as long as one hour. All responses were analyzed for differences with respect to the following demographic characteristics:

-sex
-location of practice (suburban/urban versus rural and relative proximity to a medical center)
-year of medical school graduation
-years in practice

-type of practice (solo versus group)
-employment of nurse practitioners
-socioeconomic characteristics of the practice (approximate percentage of Medicaid-eligible patients)
-size of the practice as estimated by the number of patients seen per week.

Approximately one half of the pediatricians were graduated from medical school after 1960. Eighty-nine percent of the practices were suburban/urban in location, and 62% were within 30 miles of a university medical center. Fifty-seven percent were in group and 40% in solo practice. Twenty-nine percent of the pediatricians employed nurse practitioners. Eighty-seven percent of the sample was male. Approximately 40% of the physicians saw more than 150 patients per week, with an additional 40% seeing 100-150 patients. One-third of the pediatricians estimated their percentage of Medicaid patients as from 10 to 20%, with one quarter estimating from 20 to 30%.

Further analysis of these characteristics demonstrated that younger physicians (more recent year of graduation from medical school and fewer years in practice) were more likely to be in group than solo practice. Although the result did not reach statistical significance, pediatricians located in a rural setting tended to be in solo practice (64%), compared to 38% of those in a suburban/urban setting. Group practices were more likely to employ nurse practitioners (34% compared with 18% of solo practices).

When asked to rate their formal training in development, 79% described such training as inadequate. Almost 50% of pediatricians regarded medical school as being of no value as a source

of knowledge in developmental pediatrics. Residency training fared only slightly better with only 30% feeling that it was highly valuable. These responses were independent of the year of medical school graduation.

When asked to assess the contribution of other selective experiences to their knowledge of pediatrics, 86% viewed their accumulated clinical experiences as highly valuable. Postgraduate courses and books and journals were considered at least somewhat valuable by 80% and 96%, respectively, of those interviewed.

Interdisciplinary professional contacts were described as a somewhat valuable ongoing source of knowledge by 49% with an additional 48% rating such contacts as highly valuable. Seventy-five of the pediatricians reported at least monthly communication with a neurologist, and 60 to 70% reported at least monthly interaction with a school nurse or social worker and a learning disability specialist. Forty to fifty percent acknowledged the same frequency of communication with an audiologist, psychologist, guidance counselor, classroom teacher, and speech pathologist. Approximately 32% of the pediatricians had some professional contact each month with a psychiatrist. Communication was defined as any contact allowing an exchange of information and included personal visits, telephone conversations, or reviews of reports initiated by the pediatrician or the consultant.

The socioeconomic characteristics and size of the practice had

no consistent association with the frequency of consultation with any of the disciplines included in the survey. The age of the participants as measured indirectly by the years of medical school graduation and practice did not bear any statistical relationship to the frequency of consultation with any of the disciplines, except for contacts with psychologists: the more recent the year of graduation from medical school, the greater the probability that the pediatrician had monthly or more frequent communication with a psychologist.

Despite its apparent value, pediatricians did not view practical experience as an adequate substitute for formal training in this area. Sixty-three percent disagreed and only 28% agreed with the statement that practical experience is an adequate substitute for formal training in developmental assessment skills. Years in practice did not correlate with responses.

Pediatricians markedly preferred a part-time longitudinal clinical experience, with 78% rating this as highly desirable. More traditional sources of further education such as written material and postgraduate courses were also viewed as desirable.

The value of professional contact as a source of knowledge in developmental matters has not been previously stressed. Although the study did not address itself to the quality of interdisciplinary contacts, nor evaluate the efficacy of the interaction, it did provide evidence of a substantial amount of interdisciplinary communication. The almost universal availability of consultants

in a wide array of disciplines surveyed contrasted with the experience of Pless, who found rural physicians in upstate New York indicating the need for increased availability of mental health services, neurologists, physical and occupational therapists, and speech therapists. Although the New England states may be somewhat unique in this respect, location of practice in a rural area far from a medical center did not mean isolation from a specific consultant. In some cases, it meant reliance on a child development unit in a major medical center, "accessible, not convenient". In other instances, community based developmental programs with a full range of services had been established and enjoyed frequent use and local support.

The actual frequency of recorded professional contacts was quite impressive. Significant interactions with school personnel probably reflected in large part the fact that many pediatricians serve as school physicians. In this context, the finding that 70% of the pediatricians interviewed reported at least monthly communication with a school nurse does not seem unusual. The extent of communication with learning disability specialists and school guidance counselors, however, suggests that the pediatrician's involvement in the school system has extended beyond the realm of traditional medical concern into the area of academic and behavioral difficulties.

Despite time constraints imposed by a busy practice, pediatricians

markedly preferred a part-time longitudinal clinical experience as a mechanism for furthering their education. This result underscored clearly the eagerness and commitment on the part of the pediatrician to acquire expertise in the management of children with educational and developmental handicaps.

The study raised questions regarding the economic ramifications of such training experiences. In some cases, it was thought that the practitioner might have to pay the medical center as reimbursement for staff time and resources that would have to be mobilized to create a meaningful postgraduate program. This would be comparable with the basic continuing education model that many medical centers offer practicing physicians across a wide range of clinical topics. Alternatively, hospital based training in this area could be linked to practitioner participation in the primary care aspects of house staff training. In such circumstances, pediatricians could be given continuing education options in exchange for a preceptorship of medical students or residents who might serve rotations in their offices. The specific formulae for supporting such programs will have to be determined individually by each institution.

Current attitudes and approaches to developmental disabilities in primary care settings were also reviewed in the needs assessments of physicians. At least one third of the pediatricians reported more than 20 children with each of the following problems: specific

learning disability, hyperactivity/minimal brain dysfunction, mental retardation, and language or speech impairment. Children with learning disabilities were perceived as more frequently encountered in urban/suburban as compared to rural practices. On the other hand, children diagnosed as "hyperactive" were perceived as more frequently encountered in practices located more than 30 miles from a medical center as compared to those practicing in closer proximity. No other demographic characteristics were associated with perceived differences in the number of developmentally disabled children within each practice.

When presented with a child who is cruising but not walking without assistance, 90 of the 97 pediatricians reported that they would discuss their concerns with the parents by 18 months of age even if the parents did not suspect a problem. In assessing such a child in the office, 65% would rely entirely on clinical judgement based upon the findings of a medical history and a medical examination. Twelve pediatricians noted the additional use of a laboratory study such as electroencephalograms, thyroid function tests, and skull x-rays. Twenty-five percent indicated they would employ a standardized developmental test as part of their office evaluation, and 19% named the Denver Developmental Screening Test. Physicians who employed a nurse practitioner and those who graduated from medical school after 1960 were more likely to report use of a standardized developmental test.

Each of the pediatricians was asked whether he or she would at some point refer the child for consultation. Ninety percent would, and 85% would do so by two years of age. Of those who would refer for consultation, 66% named a pediatric neurologist and 55% a child development center. No significant demographic differences were indicated.

In the case of a child who speaks single words but not three word sentences, 85% indicated they would discuss their concerns with the parents by 30 months of age even if parents did not suspect a problem. Forty-five percent included a hearing assessment as part of their initial evaluation. Nineteen percent identified a standardized developmental test as a component of their customary approach to such a problem; 14 of these named the Denver Developmental Screening Test. Here, too, the strongest discriminator was the greater use of standardized tests by pediatricians who employ nurse practitioners (43% versus 9%). Year of medical school graduation followed a trend parallel to that observed above, but was not statistically significant.

When the physicians were asked if they would at some point refer the child to consultation, 43% reported they would do so by 2½ years, and 91% by 3 years of age. A variety of combinations of referral patterns emerged: 51 respondents indicated they would seek the assistance of a speech and language pathologist, 34 an audiologist, 21 a child development center, 18 a pediatric neurologist, and 4 an otolaryngologist. Again, no significant intergroup

differences were found.

When presented with a 6 month old infant who is first discovered to have evidence of a mild hemiparesis that was not noticed by the parents, 76% of those interviewed expressed a clear inclination to refer the child for immediate consultation and an additional 19% would make the referral if the finding persisted at one year of age. All indicated they would refer to a pediatric neurologist.

Each pediatrician was asked to outline his or her usual approach when presented with "a child who's failing in school" in the early elementary years. Fifty-two percent of the respondents indicated that they would communicate with the school to obtain additional information about the child's problem. Those pediatricians were more likely to have graduated from medical school after 1960 and to have been in practice less than 20 years. Twenty-nine percent claimed they would make a referral to a medical outpatient clinic for further evaluation. The 19% who reported that they generally become actively involved in an interdisciplinary team evaluation were more than twice as likely as other pediatricians to have been in practice less than 10 years. Only 8 pediatricians responded to the problem in a manner that reflected the conviction that school failure is not a medical issue and should be deferred automatically to school personnel.

Forty-one percent of the pediatricians interviewed perform a routine hearing screening in their offices, usually beginning in the late preschool years. Thirty-two percent reported the use of hearing

tests only for suspected hearing problems, and 27% do not screen in their offices. Many of the latter group felt that office assessment was unnecessary because of active community screening programs, especially in some of the rural areas. No significant demographic differences were found among the three groups.

When presented with a situation in which a parent suggests a possible hearing impairment in a child, 3% of the respondents indicated that they would refer the child to an audiologist by 6 months of age, and 65% would arrange for a formal evaluation as early as the neonatal period. The 16 respondents who defer such referral beyond six months of age were indistinguishable from the remainder of the sample on all demographic parameters.

All the participants were asked to rate the relative frequency of their use of a number of possible approaches to "a five year old who was called 'hyperactive' by his parents". Most pediatricians tended to depend upon counselling as a main response, with less reported reliance on stimulant therapy or referral to a psychologist or neurologist. Rare use of medication was reported by physicians with practices located within 30 miles of a medical center more often than those who worked geographically further away from such centers. Those who had been in practice for less than 20 years reported rare use of psychiatric or neurologic consultation more often than the more experienced physicians. No other inter-group differences were found.

Pediatricians were asked how they would assess a three year old child who was suspected by the family of being mentally retarded. Thirty-eight percent reported that they would refer the child to a psychologist for further evaluation, 30% indicated that they would rely on their own clinical judgement to assess definitively the child's cognitive abilities, and an additional 11% would obtain laboratory studies such as EEGs, amino acid screening, and skull x-rays. Thirty-eight percent reported that they would use a standardized developmental test, and 31 of these named the Denver Developmental Screening Test. The use of a standardized instrument was reported more frequently by pediatricians who employed nurse practitioners and who graduated from medical school after 1960.

When asked to describe a subsequent involvement with the family if a diagnosis of mental retardation were to be made, 94% of the pediatricians would continue to provide routine medical care, and 60% reported that they would help coordinate involvement with community agencies and special programs.

Eighty percent of the pediatricians reported routine developmental monitoring of a 5 year old preschooler brought to the office for a well child visit. Twenty-six percent of them reported the use of standardized tests, with 7 naming the Denver Developmental Screening Test and 6 the Goodenough-Draw-A-Man Test. The remainder of that group depended on a combination of clinical judgement and their own informal non-standardized test battery. No significant

demographic differences were found between those who used standardized techniques and those who did not.

The needs assessment also surveyed pediatrician's attitudes with regard to a selection of relevant statements. Pediatricians in groups were more likely than those in solo practices to favor the delegation of responsibility for developmental assessments to a nurse practitioner, although those who actually employ nurse practitioners also tend to support such a role more frequently than the remainder of the sample. The association was not statistically significant. No other demographic differences were found for opinions expressed in response to any of the other statements. Although the overwhelming majority of pediatricians believed in the ultimate value of early identification of a variety of handicapping conditions, early detection was perceived as being less critical for children with mental retardation and cerebral palsy than for the other disabilities presented.

The overwhelming majority of the participants were engaged in private practice and reimbursed by a fee-for-service mechanism. It was, therefore, not possible to make inferences for pediatricians who work in salaried positions in neighborhood or hospital-based clinics.

Although not every developmental test was designed with an eye toward the limitations of its use in pediatric offices, their role in this setting requires serious consideration. Despite their potential benefits, they were not employed by a majority of the

participants in this study. Moreover, the Denver Developmental Screening Test was used by many of the respondents as a diagnostic tool for evaluating suspected problems rather than as a screening device as its designers intended. (This statement was supported by Dr. W.K. Frankenburg in a written communication to the authors, June 1978.) Those who reported that they used standardized tests as part of their customary approach tended to have graduated more recently from medical school and were likely to employ nurse practitioners. They did not differ from the sample as a whole in their perceptions of the frequency of handicaps in their practices nor in their attitudes towards the value of early identification. It is not possible to conclude from the available data whether the trend toward greater use of standardized tests by more recent graduates is related to different training experiences, changing practice demands when office routines were established, or other factors.

Although the quality of reported school contacts and interdisciplinary evaluation was not assessed, their mere existence confirms the acceptance of a legitimate pediatric role in this area. It is also conceivable that newly established pediatric practices are more susceptible to rising consumer pressures for greater medical involvement in school-related problems. The results of the physicians' survey once again emphasized the need for more rigorous training, which has been stressed for decades. Pediatricians, the authors noted, most need help in acquiring a broad conceptual

framework in child development within which they can communicate effectively with a variety of disciplines and report productively more sophisticated methods for evaluating children with developmental disabilities. The data collected in the needs assessment raised challenges that go beyond the call for better education. The current difficulty in defining criteria for optimal pediatric management emphasizes a need for creative, methodologically sophisticated research in the area of early intervention for developmental and educational handicaps. Well documented demonstrations of the ultimate value of specific diagnostic treatment protocols will generate far more compelling standards for pediatric care than the face validity of the current supporting data.

In addition to the needs assessment of physicians, contributions to the training programs were made by surveys of educators and parents. The BEH staff assembled a standardized questionnaire interview which was administered to core evaluation chairpersons in Massachusetts. Some very useful information was obtained by the survey that was clearly relevant to the personnel preparation grant. The physician was perceived as having an important role in compiling historical data about a child. Direct examination by pediatricians was also perceived as important and relevant. It is of interest that 100 out of 110 educators surveyed felt that pediatric neurological and developmental examinations were either definitely important or possibly relevant in most cases; therefore, sensory testing was thought to be an important part of the medical

input. Blood tests and skull x-rays were seldom deemed to be definitely important. It was of some concern, however, that so many educators thought that EEGs were important in the evaluations. This may represent some degree of misunderstanding since, in most developmental assessments, it has been found that the EEG contributes little. The physician was also perceived as having a therapeutic role. Perceptions of medical participation were examined. Ninety-seven out of 108 respondents felt that the medical evaluation was helpful in planning the child's program and useful in ruling out the presence of any suspected traditional medical problem by providing some insight into the psychiatric and behavioral issues.

When one compares the physician survey to the educator questionnaire, certain consistencies emerge. It is clear that pediatricians perceive an increasing demand for evaluative and management services to children with special educational needs. The educators define this expectation more clearly. Active participation as part of a diagnostic team and continuing consultant involvement are called for. The educators would like to rely on physicians for careful neurological and developmental assessments. The physicians, on the other hand, point out that they are primarily impressionistic or intuitive about developmental progression. It was noted that few commonly utilized standardized developmental or neurodevelopmental instruments were used by the pediatricians. It would seem logical, therefore,

that one place for medical educational input is the use of more standardized assessment tools by the physicians. Another clear educational need is the definition and preparation of the role as a team member and consultant. Included in this aspect is the training of a physician in the translation of biomedical and neurodevelopmental findings into educationally relevant insights and recommendations. A part of this task entails the joint compilation of a common language. Another important element is the establishment of a critical examination of intervention possibilities: diets, medications, and a variety of other medical and educational inputs which require systematic painstaking interdisciplinary scrutiny.

It may be that physicians need to learn how to work with parents and educators to unravel the complex issues involved in a variety of interventions. A final component of training needs to be the coordination of medical and educational intervention on behalf of children. Physician counselling needs to be integrated carefully with educational programs such that there are consistent goals and objectives, there is mutual support, and there is an avoidance of contradictory or mixed signals between physician's offices and school buildings.

To assess the needs of parents of children with developmental and educational handicaps, the following organizations were contacted:

1. Association for Mentally Ill Children (autistic and severely disturbed)
2. Massachusetts Association for Children with Learning Disabilities
3. Massachusetts Association for Retarded Citizens
4. Massachusetts Chapter of Tuberous Sclerosis Association (neurologic disorder)
5. Massachusetts Parents' Association for Deaf and Hard of Hearing
6. Massachusetts Spina Bifida Association, Inc.
7. New England Parents Association for Visually Handicapped Children and Adults
8. Parents and Friends of CP and Multi-Handicapped, Inc.
9. Prescription Parents Inc. (cleft lip and cleft palate)

An officer of each group was asked to distribute the questionnaire to parents in the organization. This was done in several ways: insertion in a newsletter, handing out at meetings, or distribution to a randomly-selected group of parents. Although lack of response limited the usefulness of this study, it was possible to glean valuable insights into the doctor-patient relationship by reading the relatively small number of returns carefully. Parents' concerns about accountability and the need for a "health organizer" for medical and related consultations were noted. These and other issues raised by the parents were taken into account as the "mini-fellowship" was developed.

Thus, the needs assessments had made clear the desire on the

part of many pediatricians for further clinical training in development and behavior and of parents and educators for more physician participation in school evaluations and the management of children with learning problems. The next step was to incorporate this information based on the review of the literature into a training program for physicians.

III. CURRICULUM DESIGN

The centerpiece of the curriculum design of the "mini-fellowship" was an annotated bibliography prepared by Drs. Dworkin, Shonkoff, and Clark. Section I presents a general overview of development, developmental assessment, and pediatric roles in intervention and management. Section II concerns the infant/toddler years, discussing cognitive development, motor development, temperament, social-emotional development, language development, sensory impairments, and the question of early intervention. Section III concerns the preschool years. In addition to those areas cited above, it looks at sensory perceptual development and preschool assessment. Section IV (the school age years) adds the subjects of learning disorders and "hyperactivity", and Section V is a review of adolescent development and behavior as it appears in the literature. Articles relating to specific modes of intervention through various areas of development are also discussed. Here is a sample entry:

> Schlesinger, HS and Meadow, KP: Sound and Sign: Child Deafness and Mental Health. Berkeley, University of California Press, 1972.
>
> Chapter entitled "A Developmental Model Applied to Problems of Deafness" is especially worthwhile. Using the organizational schema of the eight Eriksonian stages, the authors discuss the impact of congenital deafness on subsequent development. Issues of parental reaction to diagnosis, management, and psychosocial adjustment throughout the life cycle are included.

An annotated list for developmental assessment was also created. The instruments selected for the listing were those used most often in pediatric practice or in the psychological and educational assessment of children's development and functioning. They represented a sampling of assessment tools commonly used with infants, toddlers, children of preschool and school age, and adolescents. Inclusion or exclusion of a specific test implied neither endorsement nor criticism of the instrument's validity, reliability, or diagnostic utility. Here is a sample:

> Illinois Test of Psycholinguistic Abilities (ITPA)
> University of Illinois Press
>
> *Designed for use with children age 2-10, though most appropriate for youngsters from about 3½ to 8½ years of age.
>
> *Contains 12 subtests used to assess a broad range of psychological and linguistic functions and processes including short term sequential memory, association skills, grammatic closure, expression, auditory analysis, and visual recognition skills.
>
> *Helpful in analyzing abilities in reception and expression of information and in differentiating critical factors of validity (auditory-vocal versus visual-motor).

Much of the research for the annotation of both the bibliography and the instrument list was done at the Countway Medical Library. The research staff also reviewed many current journals by subscription, and several important texts and instruments were purchased for use in hospital clinics where their validity and utility could be examined.

With several components of the "mini-fellowship" curriculum in place, the staff sponsored a national symposium on training in developmental pediatrics. At this meeting held in Gloucester, Massachusetts on April 10 and 11, 1978, Drs. Shonkoff and Dworkin presented the findings of the needs assessment. Then, 65 professionals representing a variety of disciplines were charged with the formidable tasks of analyzing the current status of physician training and of developing guidelines for future models. The five study groups each addressed one of the following issues:

1. The Hearing Impaired and/or Language Disabled Child
2. The Multiply Handicapped Child
3. Early Pediatric Screening and Testing
4. The Learning Disabled Child
5. Behavior Disorders Affecting Learning

Each group was coordinated by a member of the staff of The Children's Hospital Medical Center, Boston and was composed of representatives from a number of disciplines including pediatrics, psychology, psychiatry, special education, speech and language pathology, neurology, social service, and nursing. Pediatric participants included faculty members and advanced trainees from academic settings as well as primary care practitioners. Many participants from allied disciplines were active in programs of professional development within their own fields.

Several months prior to the symposium, each participant was

asked to prepare an essay dealing with selective aspects of training in developmental pediatrics. Four levels of pediatric education were considered both in these essays and during small group meetings:

1. Medical school
2. Internship and residency
3. Fellowship training
4. Post graduate training for practicing pediatricians

Participants' papers were used as a basis for discussion during the symposium; edited versions of these were incorporated in the proceedings ("Preparing Physicians for Handicapped Children: Report from an Interdisciplinary National Symposium on Training in Developmental Pediatrics").

The precise job description for the physician dealing with the child with an educationally relevant handicap has not been defined for all areas of disability, as Dr. Levine noted in his introduction to the symposium proceedings. Whereas some study groups at the symposium were able to achieve a consensus in their conceptualization of a pediatric role, major questions remained for others regarding the extent of pediatric involvement in diagnosis, management, follow-up and advocacy. For some, the goals of professional preparation were clear; others thought that specific curriculum guidelines should await the resolution of fundamental differences regarding the number of alternative models.

The group on hearing impairment and the language disabled child was led by Dr. Terrell Clark, the special educator of the BEH

training grant. Participants included the senior speech and language pathologist of The Children's Hospital Medical Center; the Director of the Pediatric Service of the College of Physicians and Surgeons of Columbia University; the President of the National Association of the Deaf; an Assistant Professor in Medicine at the Department of Speech, University of Connecticut; the Low Incidence Supervisor of the St. Paul, Minnesota Public Schools; the Director of Child Health of Brookline, Massachusetts; the Medical Director of Children's Services of the Rehabilitation Center, Inc., Portsmouth, New Hampshire; and the Coordinator of Statewide Programs for Hearing Impaired Children of the Commonwealth of Massachusetts. Also, three interpreters for the deaf served on the panel. Several Ambulatory Department fellows from Children's Hospital also participated.

Without exception, the participants agreed that a physician is the first professional consulted when parents have concerns about their child's development. Thus, the pediatrician has a unique and vital opportunity in the management of children with language and hearing impairment. The first role of the pediatrician is that of "screener", one who listens to parental concerns, evaluates information during history taking, observes the youngster directly, and helps if there are language or hearing based handicaps.

There was no debate about whether the pediatrician should be involved in the diagnosis and management of children with language disabilities and hearing impairment. Yet, there was considerable discussion regarding <u>how</u> the pediatrician becomes involved at an

appropriate level.

One participant observed that, in community practice, "pediatricians function in a relatively traditional fashion, performing routine newborn evaluations and the subsequent follow-up office appointments at the recommended intervals, usually governed by immunization requirements. At these times, there is a tendency to inquire about developmental accomplishments rather than to observe...particularly in the instance of speech performance. I have observed that two nurse practitioners practicing within a 30 mile radius of pediatricians have become a relatively more sensitive source for referral of developmental problems than half the pediatricians. It appears, in talking to them, that additional time is taken by them to both listen to mothers and observe children. Hearing screening in most pediatric offices is done with a ticking watch or a single earphone tetraphone screening machine of questionable value (given) the significance of ambient noise found in most pediatric offices...

"It would seem too much to expect that primary care physicians can perform more than a primary screening role, referring suspects to a comprehensive evaluation center. This screening role would be improved by an understanding of the mechanics involved in performing an appropriate audiogram by soundproofing one small examining room for this purpose, by the appropriate training of nurses or nurse practitioners, and (by) a better understanding of language development".

Several participants suggested that certain information is crucial to effective screening for language disorders and hearing impairment. Areas mentioned included family history; prenatal, perinatal, and postnatal medical history; and age at which developmental milestones have been reached.

Categories that would allow children 0-3 years of age to be described as "at risk" for hearing impairment have been established after consultation between the Brookline Early Education Project (Brookline, Massachusetts) and The Children's Hospital Medical Center (Boston) hearing and speech division:

Family history of hearing loss

Prematurity

Treatment with kanamycin/streptomycin

RH incompatibility

Facial, kidney, or cardiac anomalies

More than 2 episodes of otitis media within one year

Parent concern about hearing

Staff (for example, day care teacher's) concern about hearing

These criteria are similar to those suggested by a number of professionals from separate but related disciplines.

According to Drs. Judith Palfrey and Gloria Rudisch of the Brookline Early Education Project, "seventy children (31%) were identified as meeting at least one of these criteria. The parents of these children were offered the opportunity of having a formal

audiological evaluation at Children's. Fifty-three children were evaluated. Fourteen children, or 26% of those screened, had some degree of hearing loss. Of great significance was that of those children recruited onto the "at risk" list for recurrent ear infection, 5 out of 14, or 36%, had hearing loss; and of those identified because of staff or parent concern, 6 of 8, or 75%, had hearing loss."

Having determined which observed behaviors are significant and suggestive of hearing and language problems, the pediatrician then becomes a "referrer". Making referrals to appropriate agencies, clinics and services is an important phase of the pediatrician's role. Information must be readily available regarding the location of quality hearing, speech, and language evaluations.

The pediatrician should build communication channels with other professionals so that referrals can be made knowledgably and with confidence. Pediatric training must provide the physician with the technology to be a more sensitive screener and accurate referrer. One goal of training would be to eliminate unnecessary referrals, since these services are costly. At the same time, the pediatrician must not reassure parents automatically when the likelihood of hearing or language problems is evident or suspect. Repeatedly, parents have proved to be excellent detectors of hearing loss in children, frequently raising questions about hearing sensitivity long before professionals do. When mothers or fathers express concern about their children's hearing, a referral for an audiologic

assessment should be made. To optimize the efficacy of referrals the pediatrician should communicate personally, by phone, or in writing, with the audiologist, speech and language pathologist, or other professionals.

"The pediatrician must follow up and be close to the parents in a supportive role during the initial agonizing period of waiting prior to formal diagnosis," noted the Director of the Massachusetts Office of Deafness. To accomplish this, the pediatrician shifts roles to some degree and becomes not a primary diagnostician, nor a curer of disease, but a member of an interdisciplinary team cooperating in the thorough evaluation of the child.

Dr. Gerry Storm (Portsmouth Rehabilitation Center, N.H.) stated that "to be supportive with problems involving handicapping disorders in children the pediatrician must depart from the traditional medical "oracle" role in which he feels duty bound to make definitive pronouncements about future function, future adjustment, and therapeutic strategies. It is at this point that he must become a true team member including the parents as partners, attaining insight into family dynamics, and realizing that there is no family with a handicapped child who doesn't require discretion concerning their feelings for the child and the effect of his disability on the family. He must attempt to modify the initial concentric circles of unrealistic disbeliefs and denial, understand hostility projected upon him, and attain some balance between flexibility and honesty, realizing that most parents never totally

'accept' their child's problem, continuing to hope that any small favorable change in the audiogram in the deaf child may herald the return of hearing.

"The high overhead costs so prohibitive for long counselling appointments could be reduced by the developmentally oriented pediatrician if he were to modify the practice environment and consider part-time salaried positions in community centers receiving community support and subject to lower overhead expenses. Examples might include community health centers, school health resource centers, rehabilitation units, early childhood intervention, special education programs, and university affiliated centers."

Upon receipt of the results of consultative evaluations, the pediatrician shifts to an additional role, that of an "interpreter" of information who examines what the parents understand as a result of the evaluation and explains findings which are unclear or previously unexplicated. In this role, obviously, the pediatrician needs to understand the information contained in the reports.

John Graham, an ambulatory fellow at Children's Hospital, noted that "the approach to communication disability should be an interdisciplinary one, though it is often the pediatrician who initiates the diagnostic therapeutic intervention and maintains longitudinal developmental follow-up. It is important to emphasize that specialists in hearing, language, and speech problems should relate directly to the referring physician rather than relying on

parents or children to communicate progress." Dr. Storm added that "pediatricians in training should have an opportunity to interact personally with related specialists (audiologists, physical therapists, speech therapists, nurse practitioners, psychologists, and others). Communication skills with these supportive specialists should be sharpened so that the purpose of the referral is clear and the language of the reply is understood. By observing the diagnosis and therapy of related specialists, the pediatrician will have a better sense of the services he is soliciting and monitoring."

Another role for the pediatrician is that of case manager, the local professional in a network of services provided on the basis of the child's needs. In this role, the physician aids the family by providing appropriate information regarding programs, therapeutic interventions, and other help that may be indicated for the child. With some children, the pediatrician may coordinate ongoing evaluation and systematic intervention plans. The concept of "follow-along" may be more appropriate to the close coordination of transdisciplinary efforts with some parents than occasional "follow-up" visits to check on programmatic issues and developmental progress. In a small percentage of cases where the pediatrician enjoys an ongoing relationship with the family, this professional can cease to be "the doctor who fixes things" and become involved more deeply as the family counselor.

Given the role, or roles, for which physicians should be prepared, the hearing and language subgroup next dealt with the

question of how to ready physicians for these tasks. The first question dealt with was the dimension of information level: just how much could one individual digest during medical school, internship, residency, and while maintaining a practice, given the weight of other expectations placed on that individual? The question of when and how basic information should be presented was discussed. Beyond issues of content, consideration was given to how to package the information in a manner that might have the most impact. Finally the participants discussed the major concepts and axioms about the field that they considered critical for every practitioner to grasp.

The dearth of information in medical school curricula about the implications of communication disorders is well known. Parents of hearing impaired and language impaired children are frequently incredulous of the ignorance of persons in the medical field regarding the psychosocial comcomitants of these disorders. Dr. Storm commented, "I discovered from a Boston-based senior medical student that he would graduate this spring having had no exposure to handicapping difficulties other than the single lecture on cerebral palsy in a segment of one ENT lecture devoted to hearing testing. To be credible, it appears that medical school emphasis upon training in handicapping conditions must be a stated and endorsed priority of the department chairman."

The study group members agreed that the initial vehicle for sensitizing physicians should be the introduction of developmental pediatrics into medical school curricula. A course on the "behav-

ioral sciences" should be part of the second year of medical school and should cover broadly the area of child development at an introductory level. This overview would contrast normal development from infancy through adolescence and young adulthood with delayed and deviant development. Physicians in training would become familiar with basic diagnostic techniques and tools, including behavioral observation. Well produced films could counter textbook descriptions of disabilities with personal stories of these children and their parents. It was thought that these productions would be received enthusiastically by medical students. During the fourth year of medical school, a clinical rotation in developmental pediatrics could be offered. Students with a special interest in this area might spend 4 to 6 weeks in a medical center or comprehensive health care center observing and participating in the clinical evaluation and management of children with disabilities.

The rigors, pressures, and demands placed on physicians during the PL-1 year were acknowledged by study group members who suggested that the quantity of information concerning developmental disabilities be minimal in that phase of pediatric training. The information communicated appropriately at this stage, consistent with the doctor's needs to learn to triage and treat acute problems, would be related to "high risk" patients.

The PL-2 year could offer increased didactic experiences. It would reinforce information and concepts introduced during medical school. The greatest amount of learning from allied professions would

likely come from face to face contact. Experiences with real people who live with and cope with impaired hearing and impaired communication would increase appreciation of the relevancy of the information imparted to the residents. The PL-2 could follow one child through all assessment and evaluation sessions (audiology, speech and language, psychology), observing some of these sessions and participating directly in others (such as taking family and medical histories). Several study group members suggested that interactions with adult deaf persons would be valuable for residents. One participant suggested that "we need to provide exposure to adult role models so that pediatricians and parents do not continue to associate hearing loss with children and fall into the trap of regarding or reacting to all deaf people as if they never grew up."

PL-2s and PL-3s should be able to leave their residency with what would amount to a "cookbook" of what to look for, how to investigate, and where to turn for referrals for the detection, evaluation, and management of children with hearing loss or language impairments. Such information could be packaged attractively in the form of seminars, videotapes, handouts, films, panel presentations, lunch time forums and hands-on training sessions. At least once a year, Grand Rounds should be devoted to some aspect of research of treatment of hearing and language impairment. Inclusion in Grand Rounds, Louis Cooper of the College of Physicians and Surgeons of Columbia University noted, "provides the message of endorsement from the top." During the third year, residents

should be offered a clinical rotation either at the department of hearing and speech or the developmental clinic. Such exposure would help solidify all other experiences through direct care management and contact with children and their families.

Beyond the training years of the postgraduate level, physicians must have opportunities for continuing education. The usual symposia, seminars, and short courses constitute one model of continuing medical education. During the discussion, several persons suggested that a unique experience for physicians would be to have paid freedom to step out of practice for a day or two, to accompany a patient through speech and language, audiological, and developmental testing. It was thought that such experiences might lead to the establishment of pediatric sub-specialists in development. Short of creating that level of expertise among physicians, the study group agreed unanimously that there were critically important facts and cardinal principles which <u>every</u> physician should know. These are listed below:

1. Disordered communication and hearing loss cannot and should not be equated with mental retardation or diminished cognitive abilities.

2. While language is typically and primarily conveyed vocally, the terms <u>speech</u> and <u>language</u> are not synonomous. Speech serves merely as one vehicle for expressing language.

3. Language may be effectively encoded vocally, manually, and graphically. There are legitimate, accessible, and standard non-vocal alternatives for productive communicative interaction.

4. The level of hearing sensitivity, as measured by standardized audiologic evaluation techniques, does not translate uniformly into the degree of functional use. Among individuals with similar tested decibel levels of hearing sensitivity, the effective level of detection and discrimination of sound varies widely.

5. Prescription and application of appropriate amplification devices does not and cannot restore or approximate normal hearing. Increasing the volume of amplification does not necessarily restore auditory discrimination abilities or make speech intelligible.

6. The implications of deafness encompass the individual's entire life experience. Affected are social, emotional, familial, educational, linguistic, vocational, recreational, and spiritual aspects of the person's life. Deaf children do grow up to be adults who happen to be deaf.

7. Even a mild hearing loss affects language development significantly, and children with mild hearing losses should be expected to require competent and long-term intervention by hearing and speech clinicians.

8. Results of research and longitudinal studies have demonstrated that intervention with language therapy early in life does facilitate psychosocial growth and development, as well as enhance linguistic functioning.

9. Even a unilateral hearing loss carries consequences for the acquisition of both speech phonology and syntactic form of language.

The group on mental retardation, multiple handicaps and visual impairment was directed by Dr. Alan Crocker, head of the Developmental Evaluation Clinic at Children's Hospital, Boston. Participants included the Director of the Diagnostic Clinic for Developmental Disorders of the Strong Memorial Hospital in Rochester, N.Y.; the Director of Pediatrics of Lakeville Hospital, Massachusetts; a physician specializing in developmental pediatrics in Pennsylvania;

the Director of the Inter-agency Interdevelopmental Planning Project of the Statewide Special Education Project Office of the Commonwealth of Massachusetts; the Director of the Child Development Center at Rhode Island Hospital; the Associate Director of Clinical Services at Georgetown University Hospital; the Director of Special Education of the Developmental Evaluation Clinic at Children's; and several pediatricians from the local area.

Members of the study group, all of whom came from diverse backgrounds and experiences,found themselves with many common convictions regarding the situation of the pediatrician and the multihandicapped and retarded child. The present inadequacy of systematic teaching in this area for the pediatric trainee was deplored universally. It was agreed that beyond mastery of the biomedical factors it was essential that a new set of attitudes be developed including familiarity with and accommodation to the many special human issues. It must be learned that traditional medical models for care are indeed inadequate and that the pediatrician must achieve improved communication and team skills with allied professionals. It was admitted that economic issues often militate against an in-depth office base for assistance to retarded children but, in the new linkages, the pediatrician can be a valued member of the total care staff.

A major goal of medical school education in this area was thought by the group to be the development of attitudes and perceptions, of a humanistic approach to exceptionality. In the

pre-clinical years, material in the human development course would include developmental disorders. Patients with developmental disabilities would be included in the demonstration clinics offered to students. Contact with handicapped patients would be provided in early courses on physical diagnosis and history taking, and opportunities for special projects and tutorial relationships in the field would be available. In the clinical years, there would be involvement with appropriate content in the core clinical courses, pediatrics, neurology, orthopedics, obstetrics, immunology, ophthalmology, and others. Guided electives in developmental disabilities including field experiences would be offered.

During the house staff years, the major goal was thought to be introduction to the technological aspects in human factors involved in handicapping conditions. At all levels, teaching regarding the retarded or handicapped child would be integrated into all regular clinical services, inpatient continuity and community clinics, rounds, and consultation responses. During PL-1 and PL-2 years, there would be required a block rotation of all house staff for 4 to 6 weeks in the child development center with inclusion there of interdisciplinary teaching, use of experienced volunteer faculty, contact with the infant follow-up service, site visits and field experiences, and consideration of ethical issues. In the PL-3 year, there would be elective rotations for additional experience in the child development center to involve consultation

services, contact with neurology and orthopedics, scientific studies, community programs, and pertinent office-based practicum.

For continuing education, the major goal was thought to be the demonstration of practical technology and new roles in the care of and advocacy for handicapped children. Also, it was thought important to teach early identification, family support, and management strategies and to enhance familiarity with resources and systems, public issues, and team behavior. The methods for presenting this information include ongoing teaching sessions, grand rounds and seminars, block courses (2-7 days), longitudinal clinical experiences, special workshops with interdisciplinary faculty, outreach programs from the child development center, special media materials, and in-reach programs (guidance for other clinicians in the medical center).

The fourth major area of concern was the preparation of pediatric specialists for leadership roles in service, administration, teaching, and research. A one to two year fellowship program was proposed. It would follow completion of the core pediatric training. An interdisciplinary faculty would direct efforts toward eventual achievement of special skills in:

clinical perception
judgment
strong knowledge base, also in related disciplines
sociologic and ethical issues
interpersonal techniques
administrative and political areas
project design and grant writing
awareness of service systems, community and residential programs

A local pediatrician noted that "from my vantage point of a practicing pediatrician of 25 years and for the last 5 years a hospital-based pediatrician dealing with handicapped children, many of whom have been mentally retarded, I have begun to realize the magnitude of the problem, the need for a professional team approach to managing such patients, and the ill preparedness of the average general practitioner and pediatrician for recognizing early signs of serious handicapping conditions. The weakness in the system as I see it involves the primary physician, usually a pediatrician, who has been better trained for handling acute medical and surgical problems than for recognizing the early and subtle signs of neuromuscular conditions and cognitive disabilities. There is no question in my mind that in our present day pediatric training, including the medical school level, more stress should be placed on the importance of recognizing subtle abnormal signs as well as blatant signs of neurologic disorders and physically handicapping disorders."

A physician from the Willowbrook Developmental Center in Staten Island, N.Y. noted that "my personal experiences have made it clear to me that there are a significant number of children with deviant development resulting from serious multihandicapping conditions for whom our pediatric training programs are doing a disservice. We are turning out, often in cookie-cutter fashion, pediatricians with significant competence in management of life threatening illnesses in the newborn who are able to make esoteric

diagnoses of uncommon illnesses in hospital settings but who are woefully lacking in skills in the management of children whose chronic disabling developmental disorders will never go away.

"I am concerned about the reaction of the young medical student or house officer to the encounter with a child with serious malformation, anopthalmia, spina bifida with hydrocephalus, etc. as well as children with more subtle impairments such as mental retardation with serious hearing loss. The typical and predictable reaction is fear, defensiveness, and hopelessness as they try to dwell on scientific considerations (etiology, differential diagnosis, biochemical pathways) to the exclusion of the impact on parents, siblings, and the child himself. What seems to be needed at the onset is to deal with attitudinal issues. A willingness on the part of pediatricians to 'get involved', to care about the child and the predicament of the family...They need to be concerned about the 'options' of management, to get past the initial shock of admitting that they 'don't know' and decide to join with other members of the 'team', to try to help in some useful way. Once this obstacle is passed, almost anything is possible."

Another Massachusetts physician noted that "firstly, the trainee must have received the 'call' - to appreciate the worth of and recognize his role as advocate for 'imperfect' groups of children or individuals. He must have graduated beyond the naive concept that only the potentially perfect person (e.g., IQ greater than 120, attractive appearance, 20/20 eyesight, practical productivity)

is worthy of his attention and efforts. Secondly, the trainee must be capable of facing the challenge of complexity. Each child usually presents many problems, medical, psychosocial, educational....and the pediatrician must act as coordinator of other disciplines dealing with these. Thirdly, the trainee must be capable of resisting discouragement arising out of chronicity and limited outcome inherent in many of these children. He must be a constitutional optimist and not require a perfect result to 'get his kicks'. Thus, instead of dwelling upon the tragedy of the handicaps, he appreciates the value of 'picking up the pieces', all the pieces, to the best of his and his team's ability to help the child approach a happy and possibly productive life. Finally, he must recognize that his potential income cannot depend upon fee-for-service piecework involving large numbers of patients with procedures such as one encounters in a routine office or hospital practice."

In the area of early screening and detection of developmental disability, Dr. Paul Dworkin, a fellow in Ambulatory Pediatrics at Children's Hospital, was the group leader. Participants included the Director of the Child Development Unit at Children's Hospital; an Associate Professor of Clinical Services at Roosevelt Hospital, New York; a staff member of the Education Development Center in Newton, Massachusetts; the Nursing Director of the Brookline Early Education Project (Massachusetts); two pediatricians from

Maine; two fellows in Ambulatory Pediatrics at

Children's Hospital; a Senior Pediatric Resident from the University of Vermont in Burlington; and the Director of Research and Professor of Social Work at Simmons College School of Social Work in Boston.

The mandate for this study group was to define the pediatric role and offer recommendations for a specific training curriculum. The group sessions were divided into four major areas. The first dealt with the current pediatric role and the potential for its enhancement. The second examined some existing pediatric models and attempted to answer the question, "What is being done?" The third session dealt with current training in terms of what is now being taught, and the last tried to answer the question, "What should be taught, and how should it be taught?"

Participants were unable to generalize a specific role for the pediatrician as a diagnostician. The pediatrician's expertise and access to resources and services were thought to influence his or her specific role. In general, it was felt that the pediatrician should seek additional consultation and call for help when service needs dictate. The purpose of further assessment or referral should be to obtain services.

In general, the group felt that pediatricians can select for themselves the level of assessment at which they feel comfortable. For some pediatricians with an interest or special expertise in development, a formal assessment is appropriate. The group cautioned, however, that "formal" assessment requires a multi-disciplinary approach and, therefore, requires referrals and the use

of consultation services.

The group agreed that screening in its basic sense should be done at all ages. The pediatrician must listen continually to pick up cues, perform interactional observations, and monitor behavior in a longitudinal fashion. The pediatrician must be sensitive to developmental issues at all ages and be aware of normal deviations.

Participants also addressed the question of which tool should be utilized in screening. Again, a standardized approach rather than standardized tools was deemed necessary. With a thorough appreciation of the process, the lack of a need to generate a specific score or a label will be better understood.

The group agreed that, in the private practice setting, the identification of "red flags" is the primary role. Problems are identified by listening to parents and asking key questions. The need to utilized longitudinal assessments in primary care settings and to be familiar with and able to direct the family to appropriate resources was stressed. It was felt that the pediatrician must be developmentally oriented at all times, gathering data through ongoing screening. The group contrasted private practice, in which a large number of children must be seen in a day, and the consultative hospital setting, in which an enormous amount of time is spent evaluating one child. Clearly, the latter is not a viable model for primary care. Longitudinal observations are not usually available in this setting, but the more extensive nature of the assessment as well as the multidisciplinary model

compensate somewhat for this deficit.

In the area of current training, one participant commented upon the sparsity of training in developmental handicaps. Another noted the value of an experience during residency training which involved visiting outside agencies and observation of children in nursery schools and schools for the multiply handicapped. The roles of didactic instruction, clinical experience, and literature review were discussed. In general, it was thought the lecture format is used most often; it was not felt to be very useful. A pediatrician who had recently completed his training said that in his experience training that was purely didactic was meaningless. A practicing pediatrician affiliated with the George Washington University School of Medicine stressed the importance of early exposure to outside agencies such as nursing schools, schools for the blind, and developmental assessment centers. He noted that, early in the student's training when he or she is "idealistic", there exists an ideal opportunity to learn the role of school personnel and other professionals. One participant warned, however, that the compulsive medical student may not be ready simply to observe children without receiving more formal teaching.

In general, information regarding children with developmental dysfunction does tend to be transmitted on the traditional pathological medical model. The information transferred regarding normal development is limited; thus, a "disease orientation" is taught. The programs which incorporate developmental assessment within the primary

care setting are limited. Most programs tend to be quite unsupervised, unstructured, and fragmented. The group noted that although history taking is taught in medical schools, interviewing techniques often are not addressed. The nurse on the panel said that although interviewing technique is crucially important to both nurses and physicians, nursing and physician training do not overlap. Interviewing technique is stressed to a greater extent in the training of nurses.

As did all the groups, the screening session discussed the question of costs. How to pay for the resident's time away from the hospitals in an educational setting is a prime concern, for example. If the hospital is paying the resident for hospital based service, how can an educational rotation be justified with respect to cost? In order to restructure residency training, some adjustment of the financing of pediatric education is imperative.

The consensus of the group was that there were as yet no successful postgraduate programs being implemented in this area. The programs that did exist tended to be very fragmented, varied, and uneven.

Training of pediatricians was thought not to relate well to other disciplines such as early childhood education, psychology, psychiatry, and nurse practitioners. Regarding future training, the groups stressed the importance of a standardized interdisciplinary approach. Such information can be taught only in a setting

where strict supervision is provided. It was agreed that there was a limited but definite role for didactic instruction and the pathological model. The basic science of child development needs to be presented in a manner similar to that of other basic sciences. A combination of clinical experiences with didactic instruction is necessary. Observations within a natural setting are important. Totally hospital oriented training programs are unsatisfactory for training in developmental assessment.

It was thought that the specific medical school training model should involve didactic lectures as well as clinical experiences incorporating the pathological model. It would be imperative that this integrated course be highly structured and supervised, particularly those aspects utilizing exposure to children in natural settings. For the residency years, participants felt that the developmental approach should be taught within the continuity care setting. The teaching of developmental observation should be integrated within the outpatient department and the wards. Outside rotation was considered essential.

Marian Hainsworth of the Educational Development Center, Newton, Massachusetts, noted that certain areas of didactic teaching of literature reviewing in pediatric training should be considered. "In my experience", she wrote, "physicians are well acquainted with the motor milestones within the first two years of life; however, their developmental expertise is often limited to that. With all the information now available to us about language, visual-percep-

tual-motor, and emotional and behavioral growth and development, pediatricians should definitely be as knowledgeable in these areas as they are in gross motor development. Particular emphasis should be placed on language and self organizational (attentional) development and deviations."

James R. MacMahon, a practicing physician from Maine, suggested a "mini-fellowship" in which practitioners would receive "some basic training for, say, two months and then return to the major center every two months for a one-week program in which their training would be enhanced and their experiences reviewed.... (this program is) designed to keep practicing pediatricians practicing. To train them without destroying their practices is a feat that must allow them to remain available to their patients, as this is often the foundation of a pediatric practice."

Dr. Ernest Krug, a fellow at The Children's Hospital Medical Center, Boston, hoped that "pediatricians will accept the challenge and add to their present contribution toward the maximization of individual potential and the minimization of dysfunction in childhood. ....the present 'diagnostic model' seems inadequate to the task. A truly positive contribution will require an integrated model which can appreciate the gestalt formed by behavior, temperament, and individuality, realizing that these merely point the way towards personal identity."

The group concerned with the evaluation and management of children with learning disorders was directed by Dr. Melvin D. Levine,

Chief of the Division of Ambulatory Pediatrics at Children's Hospital and Principal Investigator of the Bureau of Education for the Handicapped training grant. Participants included area pediatricians and educators, the Associate Director of the Developmental Clinic of the Children's Hospital of Pittsburgh, the Associate Director of the University Affiliated Program for Learning Disabilities at the University of Cincinnati College of Medicine, a professor of psychology from the State University of New York at Stony Brook, the Medical Director of the Winston School in Dallas, and the Assistant Director of Ambulatory Pediatrics at the Stanford University Medical Center.

The group articulated a variety of obstacles that stand in the way of an optimum pediatric role in dealing with learning disabilities. These can be summarized as follows:

1. Lack of time
2. The prevalence of a "camp physical" type of evaluation
3. Lack of familiarity with interdisciplinary collaboration
4. Lack of a basic science
5. Lack of identification as a discipline interested in these problems
6. Lack of training
7. The current state of school health. This poorly defined "discipline" could be a critical nidus for the interaction of pediatrics and education, but such a model has not been elucidated and demonstrated adequately.
8. Lack of reimbursement for services
9. A lack of understanding of community resources
10. A lack of good communication channels with the school
11. Variability of interests. Not all physicians feel that learning problems are related to pediatrics.

Despite these obstacles, most members of the group felt that pediatric involvement is necessary and is in demand. There is a

growing interest in the pediatrician as a generalist and as an unbiased coordinator of "independent" evaluations.

It was agreed that many physicians throughout the country are involved in school health but are confused as to what the developmental consultative role should be in school settings. The participants concurred that this is a potentially fertile area for pediatric growth. It was noted that there are a number of good models in which the physician serves as a consultant in development. It was also pointed out that the nurse practitioner might interact with the physician in providing comprehensive consultative services to children with special needs in the school health setting.

It was emphasized that for physicians to be maximally useful in the learning disorders field it will be important for them to share a taxonomy with educators and other professionals. At the same time, it was thought to be important to be judicious in the use of diagnostic labels in children. One observer noted that labels should tell us what is going to happen to a child without causing it to happen!

The group had a great deal of difficulty agreeing on the kind of tools that pediatricians should be given for the screening and assessment of children with learning disabilities. The traditional physical, sensory, and neurological examination as well as comprehensive histories were endorsed. The use of the pediatrician as a neurodevelopmental evaluator was a matter of some disagreement within the group. Several participants felt that the pediatrician

needs a developmental "stethoscope" to observe learning problems directly. They insisted that the pediatrician could not manage or participate in the management of a learning problem by hearsay. It was their feeling that the physician needed to observe dysfunction directly through the use of neurodevelopmental tools. Others in the group felt that this was not practical logistically, and that it was not necessary for pediatricians to perform such evaluations.

The group considered whether the pediatrician ought to observe a child reading. Some members felt that this was inappropriate. Most of the physicians believed, however, that it was useful for a physician to observe a child reading and that an important part of pediatric training ought to be focused on the enhancement of pediatric observational skills in such areas. Several special educators in the group were concerned that it was misleading to observe a child reading out of the context of the classroom and without knowing more about the specific curricula with which a child had been taught to read. A psychologist expressed misgivings that pediatricians could become psychometrists. He felt that this was dangerous and could lead to new forms of unhelpful labeling. Another psychologist suggested that when parents knock on the door and ask for help with a school problem, the physician should consider not opening it! Despite these qualifications, the consensus appeared to be that physicians should engage in some direct assessment of development and learning in their offices.

The group concurred that training in these areas should begin very early in medical school. There was a consensus that a specific course in human development should be offered in the first or second year. It was also felt that medical school ought to include developmental pediatrics as part of the core experience in child health for students. To some extent, this could be done through didactic lectures and presentations; however, the bulk of this training needs to occur in specialized developmental pediatric clinics. The training of interns and pediatric residents was thought also to include more intensive work, greater direct responsibilities for patients, and more skill acquisition with regard to the utilization and interpretation of diagnostic tools. It was felt essential that elective courses be established for those interns, residents and medical students who have special interests in this area.

The pediatric neurologist in the group emphasized the need for pediatricians to have more training in the neurology of development. In particular, he felt that it was important for pediatricians to be able to evaluate and understand higher cortical function from a neurological point of view. It was also felt important for pediatricians to become more involved in the basic sciences relevant to this area. Included might be such fields as neurochemistry, neuroanatomy, and neuropsychology.

There was considerable discussion of fellowships in development which would enable pediatricians to become subspecialists in

learning disorders. A number of questions were raised. Should such fellowship training be combined with the study of high-severity/ low incidence handicaps? This combined field might be called "developmental pediatrics". Or, alternatively, should one be able to specialize in learning problems without having advanced training in the more severe developmental handicaps? No consensus was reached. There was general agreement that fellowship programs in this area should follow the model of other medical subspecialties. There should be an emphasis on acquiring knowledge of the basic science of the field and of the techniques utilized by the pediatricians and those in other disciplines. There also needs to be involvement in research in the development of teaching techniques. The group was unable to resolve the issue of how comprehensive these fellowships ought to be with respect to subject matter. In addition to the aforementioned questions about the inclusion of the severely handicapped child in a developmental pediatric fellowship, there were also issues regarding the inclusion of behavioral pediatrics in a developmental pediatric fellowship. It was agreed that there might exist throughout the country a variety of models of fellowship training with varying emphases. There was no consensus about a core curriculum for all of these fellowships.

There was general agreement that pediatricians who were already in primary care would need ongoing training in developmental pediatrics. It was noted that workshops or other forms of lecture programs were informative to pediatricians but failed to alter their

behavior or their involvement in this area. Ongoing work in medical center based clinics seems more helpful to the pediatricians in practice. The development of mini-fellowships for physicians in the community was seen as a very promising model for their training.

Regarding the mini-fellowship, Dr. Alan O. Ross, Professor of Psychology at the State University of New York at Stony Brook, commented, "I think it would be helpful if the pediatrician in training were to spend some time in an elementary school as part of a regular rotation assignment. I am told that it is an important aspect of medical education to be on duty in the emergency room of a hospital. The pediatrician in training is likely to find that the elementary school is almost as hectic, almost as crowded, almost as full of crisis, possibly almost as bloody as the emergency room. People may not die there, but lives are enhanced or ruined depending upon the decisions made by those who are in charge of the school."

Dr. David T. McCormick, a pediatrician practicing in Concord, Massachusetts, noted that "what I seem to have missed most in my training years were basic courses in what I broadly term 'communication disorders'. Most learning problems result from disorders in cortical function that involve auditory and visual processing. Successful learning in a classroom is particularly dependent upon adequate auditory and language skills. A formal course on the evaluation and treatment of communication disorders would be helpful for residents who intend to specialize in child

development. The course would cover such subjects as the aphasias, less severe disorders of receptive and expressive language function, and common recognizable syndromes associated with learning disabilities. The course should be as specific as possible in describing the methods used to arrive at a diagnosis."

The group studying behavior disorders affecting learning was led by Dr. Jack Shonkoff, Director of the Developmental Consultation Program at The Children's Hospital Medical Center. Participants included a staff pediatrician and a staff psychologist from Children's; an Assistant Professor in Special Education at Lesley College in Cambridge, Massachusetts; a pediatrician from Media, Pennsylvania; a pediatrician from Swampscott, Massachusetts; the Chief of Children/Youth Services of the Elmira Psychiatric Center in New York; the Director of Pediatric Psychology at the University of Maryland Hospital in Baltimore; a pediatric fellow in psychosomatic medicine at The Children's Hospital Medical Center; and the Director of the Department of Psychiatry at Montreal Children's Hospital.

Members of the study group agreed that the responsibility of the primary care physician begins in the realm of prevention. Once problems begin to emerge, the need for early detection and evaluation is critical. Beyond the initial assessment stage lies the ultimate need for effective intervention and ongoing treatment.

It was noted that the pediatrician must feel comfortable with the belief that behavior problems are worth his or her effort. The

need for pediatricians to be aware of their own reactions to children and families in order to best evaluate data from a variety of sources was underlined. This ability to look at oneself needs to be combined with a sensitivity to feelings and a capacity for empathy that transcends the simple administration of assessment techniques or therapeutic interventions.

Good will and sensitivity are certainly not enough. Although the consensus regarding the importance of proper attitudes was strong, the group was equally concerned about the need for technical skills and expertise. Seven requisite skills covering a wide range of competence were identified:

1. a broad understanding of normal child development
2. sophisticated interviewing skills
3. sensitive observation skills
4. facility in the use of broad-based neuro-developmental assessment tools
5. ability to interpret standardized diagnostic and achievement test results
6. creative use of referrals and the ability to enter into cooperative professional relationships
7. treatment skills

The goal of the pediatric assessment should be the construction of a dynamic longitudinal portrait of the child and his or her world. This information provides the basis for understanding the ingredients that contribute to the evolution of a behavioral disorder and for beginning to choose among a variety of options for further management.

Further discussion dealt with the challenge of designing

curricula for training in the assessment and management of behavioral problems. The "aura of negative mythology" surrounding such programs was considered by the group. One member's experience favored the need to offer "behavioral pediatrics" as an elective rotation during the residency years to avoid the sabotage effect of antagonistic housestaff. Another member of the group was a strong advocate of a compulsory experience for all residents. After some discussion, the group agreed that pediatricians in training should not have the option of avoiding such material but that the ultimate success of any program is highly dependent upon the degree of support it receives from the chairman of the department and the rest of the senior faculty.

The clinical years in medical school are seen as a time for providing a broad introduction to the basic science of human development which should include a comprehensive survey of the normal life cycle from conception through old age, covering such wide-ranging issues as separation-individuation, adolescent sexuality, divorce, retirement, and death. Assignment of each student to a family has been implemented successfully in many settings and provides a mechanism for giving special meaning to the life issues being studied. The pediatric clerkship was viewed by the group as a time to begin to teach interviewing skills, with attention to the pediatric developmental history and assessment of family dynamics.

Residency training presents an opportunity to continue to sharpen interviewing skills in conjunction with the learning of standardized assessment techniques and management options. The need to keep the educational process focused on a continuous relationship with children and families was supported by all participants. Thus, isolated experiences at single points in time were viewed as relatively poor media for learning about behavioral problems. Closely supervised practical involvement in a primary care experience, on the other hand, was seen as a far more productive vehicle for developing an understanding of the vicissitudes of child behavior.

Educational options for practicing pediatricians were also discussed within the study group. The need for clinical experiences with appropriate supervision was stressed again; the importance of preceptors was perceived to be as necessary for practitioners as for residents. The added potential value of the "practitioner-student" as an effective teacher and role model for medical students and residents was noted also.

The question of the need for a pediatric behavioral subspecialty was also entertained and generated some disagreement among the participants. Although the demand for specially trained pediatricians for teaching and research was accepted generally, the practicing pediatricians in the group were committed to the position that every primary care pediatrician must be a developmental/behavioral "specialist". Despite a recognition of the value of interdisciplinary collaboration, the need for a sophisticated generalist role model

for physicians in training was stressed vigorously.

The proceedings of the symposium on the preparation of physicians for serving handicapped children were distributed to the chairmen of departments of pediatrics around the country and formed an essential part of the design of the "minifellowship" at The Children's Hospital Medical Center.

Another important element of the curriculum were videotapes of several children who demonstrated certain varieties of educational dysfunction. These were produced with the assistance of the New England Developmental Disabilities Communications Center. The tapes not only illustrated performance as it could be assessed in the physician's office but also portrayed the children at home and at school, in natural settings where school problems could be observed in a less formal manner. The first tape produced described an eight year old second grader with language problems. It illustrated his weakness in that area as well as his strength, in gross motor activities. The second tape was of a third grader who was "hyperactive". He was filmed while on and off medication, both in his doctor's office and in his school classroom. This tape demonstrated many of his difficulties with attention and, at one point, made this disability quite clear when, during an examination, his attention was distracted by a low-flying airplane passing over the hospital. Although the sound was quite subtle, he immediately concentrated on it to the exclusion of the examiner's instructions. The third tape was made of a third grader with

behavior problems. He had a very flat affect and did not respont to praise for tasks well done. The assessment showed ways in which this behavior could be elicited at the same time that his obvious strengths in certain academic fields were noted. This evaluation led to a recommendation for further psychiatric assessment for the child. It was thought that the video tapes would be a useful adjunct to the didactic sessions and they were, in fact, received well by the mini-fellow trainees.

Another area of interest for the preparers of the curriculum was the medical implications of PL 94-142, the federal Education for all Handicapped Children ct. In 1978, Mr. William Twarog began an investigation under the auspices of the Bureau of Education for the Handicapped and the American Academy of Pediatrics (AAP). His report, "Patterns of Physician Participation in the Evaluation of Handicapped Children for Special Education Programs: A Report on State Regulations", was circulated to all state chairmen of the (AAP). Mr. Twarog's responsibilities included 1)provision to AAP chairpersons or their designees data concerning the implementation of PL 94-142 in their respective states, 2) suggestion of areas for action by pediatricians in the formulation of the special education policies in their states, and 3) availability to the chapters for consultation.

The initial attempt at accumulating data concerning the implementation of PL 94-142 on a state-by-state basis focused on reviewing the annual program plan prepared by each state

education agency. It was determined that the most critical information for physicians to have from this review included the following:

1) the names and addresses of the Chief State School Officer and Director of Special Education,

2) the coordinating and cooperating agencies in the state's child identification program,

3) the participants in the development of the individualized education program,

4) the medical components of the evaluation process, and

5) any other related information which might have specific implications for the physician.

As this review was being completed, it was evident that the annual plans were inadequate as a sole source of information, especially in the area of physician involvement in the evaluation process. Further, the role of physician is not always described in the plans. Therefore, a survey which included items pertaining to the physician's role in special education was prepared and sent to the Director of Special Education in each of the 50 states and the District of Columbia. In addition to responding to the questions, the Directors of Special Education were requested to send copies of the current rules and regulations of special education for their state, their fiscal 1978 or 1979 annual program plan, and a list of members of the state's special education advisory council.

After a discussion of the physician's role in general terms, each state's special education regulations were reviewed. For

example; in the matter of hearing impairments, the study reported that an evaluation by a physician is required in Alabama, Arkansas, Illinois, Montana, New Mexico, North Carolina, North Dakota, Oklahoma, Texas, and West Virginia; evaluation by a physician and an audiologist is required in the District of Columbia, Hawaii, Indiana, Nebraska, New York, Ohio, Rhode Island, Virginia, and Wisconsin; and an evaluation may be performed by a physician or an audiologist in Alaska, Idaho, Louisiana, Mississippi, Missouri, Nevada, New Hampshire, Oregon, Pennsylvania, South Carolina, Tennessee, and Vermont.

An evaluation was required or recommended for all degrees of retardation in California, Hawaii, New Mexico, Oregon, and Virginia; for mild retardation in North Carolina and West Virginia; for moderate or trainable mental retardation in the District of Columbia, Georgia, North Carolina, North Dakota, and West Virginia; for severe mental retardation in Georgia, North Carolina, and Pennsylvania; and for profound mental retardation in the District of Columbia, Pennsylvania, and Utah.

A review of state regulations determining the course of physician participation resulted in the following conclusions:

1) the actual frequency with which a physician's examination is utilized as part of the evaluation process for special education is not consistent with PL 94-142 policy which includes "health" as one recommended area of assessment

2) when state regulations indicate the need for a physician's participation in the evaluation of handicapped children, it is most often a categorically based examination by a specialist

3) the language and terminology used by the states to describe the physician's participation in the evaluation process is vague and imprecise.

To this report were appended excerpts of state special education regulations.

As all this information was drawn together, a training manual for the mini-fellows was published. It included the annotated bibliography and annotated list of instruments, parent and teacher questionnaires used in the developmental clinics at Children's Hospital, case studies to accompany the videotapes, and outlines of didactic lectures. These lectures were as follows:

1. Introduction to Fellowship, Overview of Clinics and School Health Site, Administration of Pre-Test
2. Clinical Procedures 1: developmental histories, use of questionnaires
3. Clinical Procedures 2: introduction to the neuro-developmental examination of school age children
4. Introduction to Speech and Language Evaluation
5. Introduction to Audiological Evaluation
6. Diagnosis of Specific Learning Disabilities in the School Age Child 1
7. Diagnosis of Specific Learning Disabilities in the School Age Child 2
8. Issues of Attention and Activity in the School Age Child
9. Evaluation and Management of Developmental Problems in Adolescence
10. Developmental Issues in the Preschool Years

11. Assessment and Management of Developmental Problems in the Preschool Years

12. Developmental Assessment of Infants and Toddlers 1

13. Developmental Assessment of Infants and Toddlers 2

14. Management of Developmental Problems in Infants and Toddlers

15. Evaluation and Management of the Multihandicapped Child 1

16. Evaluation and Management of the Multihandicapped Child 2

17. Evaluation and Management of the Child with Hearing Impairment

18. Discipline, Management, and Counseling Issues

19. Overview of the Pediatric Role in the Management of Developmental Problems

20. Administration of Post-Test; concluding session

The mini-fellows' clinical participation was centered in the following programs at Children's Hospital:

1. the School Function Program, which deals with the academically failing child from age 5 through adolescence;

2. the Preschool Function Program, which evaluates and monitors children between the ages of 3 and 5 who present with specific questions related to school readiness, behavioral problems, developmental dealy, or questions with regard to hyperactivity;

3. the Developmental Consultation Program, which evaluates and offers follow-up care to young children below the age of 3 who are suspected of having developmental delays;

4. the Behavioral Pediatrics Program, which evaluates children beyond the age of 5 who demonstrate behavioral and emotional problems;

5. the Pains and Incontinence Program, which deals with children presenting with complaints frequently regarded as concomitants of developmental dysfunction e.g., recurrent abdominal pain, enuresis, encopresis, and headaches).

In addition to these clinics, mini-fellows were to participate in the Developmental Evaluation Clinic, in which moderate to severely handicapped children are evaluated and managed. It was anticipated that individual trainees would have specific interests in various clinics, and the program was designed to be flexible enough to accommodate them.

Despite the long-held view that a school-based longitudinal experience for pediatric trainees was critical for their appreciation of normative development and educational principles, few training programs have incorporated a school health component. A recent report noted that only 22% of the new pediatric practitioners in the sample had any school health experience, even though 65% of them were providing school health services. Such data support the belief that doctors prescribe for resource rooms without understanding their function, just as educators request EEGs and neurologics without sufficient knowledge of their purpose. This informational poverty has aided the development of adversarial relationships between doctors and educators.

The school health site component of the postgraduate developmental fellowship at The Children's Hospital Medical Center was designed to address this gap in pediatric training.

The school health site for the mini-fellowship attempted to demystify educational jargon and to illustrate basic developmental concepts in a more natural setting than a hospital, to reveal the range of potential educational interventions for children with developmental handicaps, and to develop a comfortable, non-threatening consultative model for interactions between physician and educators.

The Melrose, Massachusetts school system was selected as the site of the program. Melrose is a community of 30,000, 5000 of whom are school-age children. There are 10 neighborhood elementary schools, a middle school, and a high school. The citizenry is predominantly white, middle class, and nontransient. There is a significant minority population. The Melrose school system offered a vigorous Director of People Personnel Services, a special education program known for its excellence, reasonable proximity to the medical center, and an enthusiastic welcome to the project staff.

As mandated by Massachusetts Chapter 766 (the state's forerunner of PL 94-142, the Melrose School Department has identified approximately 650 children as having special needs. These needs are addressed with varying intensities depending upon their educational impact. A complement of teachers, school adjustment counselors, school psychologists, and school nurses are attached to each school. In the Franklin School, where the majority of substantially separate classrooms are located, there are speech and language therapists, an adaptive physical education instructor, a physical therapist,

and occupational therapists on site full and part-time.

The mini-fellows were scheduled for at least two visits to the school health site during their training. They were accompanied by a pediatrician from the medical center and were presented with an expert's view of elementary school education by a Melrose special educator during their first visit. The acquisition of readiness skills, reading, spelling, math, and penmanship was discussed. During their second visit, educational materials were presented. The fellows viewed the special equipment available to children with varying developmental and academic delays. Regular and special reading texts were examined. Instructional materials aimed at strengthening perceptual skills and furthering general academic ability were demonstrated.

Participants observed classes for high risk preschoolers, moderately retarded children, children with severe physical disabilities, and emotionally disturbed children as well as regular classrooms with mainstreamed special needs children. After observing a preschooler with a cluster of developmental delays, the fellows were shown the classroom where that child might be placed in five years. This allowed them to appreciate the potential for skill acquisition which most children possess and to view the variety of teaching techniques that aid this learning. Each fellow was able to consider the contribution his or her pediatric expertise might make in the classroom.

The final portion of the morning's visit was devoted to a consultation program. The Melrose staff presented to the medical center pediatrician and the fellows histories of children about whom they needed more information and advice. Any child the school felt was appropriate could be discussed. The classroom teacher, special educator, school psychologist, and other professionals involved with the child reported on their roles. When necessary, the medical center pediatrician and the fellows observed the child in class and performed a neurodevelopmental examination. Based on the assumption that the physician is uniquely qualified to address some of the biological, societal, and psychological components of disability, the program tried to take a fresh look at each child from an integrated perspective.

A system of guidelines was derived from this project. Although some are specific to the Melrose site, many are generalizable for others interested in replicating such a program:

1. The school system selected must have an enthusiastic pupil Personnel Director.

2. A receptive director will calm inevitable territorial anxieties that are a part of the introduction of any new program.

3. The hierarchy and training levels within the special education department must be understood.

4. Organizing a consultative program and watching it evolve provided valuable insights into the school's perception of the pediatric role. The project staff saw a gradual shift in the types of cases presented from those involving solely traditional medical concerns (hearing loss, syndromes and seizures) to those involving predominantly

issues classified as "new morbidity" (psychosomatics, behavioral problems, and information processing disorders). Physicians were asked to interpret medical jargon, to synthesize and integrate the complex developmental and medical variables that might result in school failure, and to act as liaisons for the school with the medical community.

5. Many of the fellows were school physicians, and most responded positively to the potential expansion of their roles. Though they felt somewhat anxious and unprepared to attempt such a change initially, most were offering helpful comments during consultation time before their fellowships were completed.

6. At the beginning of the program, classrooms were disrupted somewhat when the physicians made their visits. Both the children and the teachers altered their normal activity. As the program's focus became more clear, and the teachers came to realize that they were not being judged but were, in fact, faculty members of the fellowship program, this problem essentially disappeared. Certain fellows did remain more intrusive than others and this was dealt with individually.

7. Local physicians must be contacted when the program is being implemented.

An article based on the school health experience was published in The Journal of School Health in August 1980. It includes a description of the evaluations of children seen by the program. This is a sample:

Number	Age	Sex	Historical Highlights
2	5	M	Down syndrome Multiple episodes of otitis media Multiple contradictory audiograms Questionable seizure disorder Currently on Dilantin

Referral Questions	Assessments
1. Why does this child have decreased expressive language skills compared with receptive skills?	History, observation, review of hospital audiogram, and ENT consult
2. Is hearing aid appropriate?	

Consultation Outcome

1. Child should have amplification at all times in school.
2. Discussed Down syndrome, specifically associated hearing loss.
3. Suggested full language evaluation.
4. Telephoned involved neurologist, clarified drug status, and arranged follow-up appointment.

IV. THE PART-TIME FELLOWSHIP

In the fall and winter of 1978-79, a part-time fellowship in developmental pediatrics was begun at The Children's Hospital Medical Center. Eight Massachusetts physicians participated in the program. They were:

J. Stanley Carp, M.D., F.A.A.P., of Saugus. Age: 63. Degree: University of Middlesex Medical School (1940). Internships: Clark Memorial Hospital and Jefferson Park Hospital, Chicago. Preceptor: University of Massachusetts Medical School.

William A. Dickson, M.D., of Wellfleet. Age: 61. Degree: Cornell (1943). Internship: The Children's Hospital Medical Center, Boston. Residency: Massachusetts General Hospital. Instructor: Harvard Medical School (1955-1972).

Thomas J. Murphy, M.D., of Brockton. Age: 56. Degree: Yale University (1946). Internship: Hartford Hospital, Connecticut. Chief of Pediatrics, Cardinal Cushing Hospital, Brockton (1968-1978).

Ilana Kraus, M.D., of Boston. Age: 43. Degree: University of Geneva Medical School, Switzerland (1964). Residency: Long Island College Hospital, Brooklyn, New York. Pediatrician, Brookside Park Family Life Center, Boston. Clinical Instructor in Pediatrics, Harvard Medical School. Preceptor to first-year Harvard Medical students and to the Pediatric Nurse Practitioner Program of Northeastern University, Boston.

Philip Nedelman, M.D., of Braintree. Age: 43. Degree: University of Cincinnati Medical School (1961). Internship: Naval Hospital, Philadelphia. Family practitioner. Elected during mini-fellowship to presidency of the Massachusetts Chapter of the American Academy of Family Physicians.

Maria Gerson, M.D., of Stoughton. Age: 40. Degree: University of Rome, Italy (1972). Residency in physical medicine and rehabilitation: New England Medical Center Hospital, Boston.

Cheryl Kerns, M.D., of Boston. Age: 31. Degree: George Washington University School of Medicine (1973). Internship: University of Michigan. Residency: Boston City Hospital and Tufts Boston Floating Hospital. Pediatrician at the South Boston Health Center.

Michael Gilchrist, M.D., of Chelmsford. Age: 34. Degree: Vanderbilt University (1968). Internship: Yale New Haven Hospital. Residency: North Carolina Memorial Hospital.

In all, approximately 600 invitations were sent to a group of randomly selected physicians within a thirty-mile radius of Boston. Of the 15 responding, 9 were selected (one had to drop out due to his inability to obtain coverage for his practice). These individuals were offered a nine-week (two days per week) program of instruction. As mentioned above, they participated in developmental clinics at The Children's Hospital Medical Center, didactic sessions, and visits to the school health site.

Each trainee was administered a pre-test and a post-test to evaluate knowledge before and after the fellowship. All the pre-test scores were below the 72nd percentile; on the post-test, all improved by an average of 12%.

The physicians trained during the part-time fellowships were interviewed by staff physicians 3 to 4 months after their experience. They were asked for their original reasons for participating in the fellowship; their answers included:

1. increased referrals of developmental problems
2. lack of training (one said that this was the area for which medical school had prepared him most poorly)
3. a desire to cut down on acute medical cases
4. working in an area underserved by developmental pediatricians
5. interest in the problem
6. a spouse who performed learning disabilities tutoring
7. an interest growing out of work as a school physician
8. a need to brush up on the latest techniques

The fellows felt that their expectations had been met either in full or in part by the program. One noted that his expectations had been surpassed. Another said that he "originally saw these kids as just disciplinary problems. I now see them from a different perspective."

In answering a question concerning unanticipated benefits,

the fellows reported that:

- they were overwhelmed by the diversity of the field
- that they had gained insights into how to deal with families
- "my whole philosophy was changed"

The trainees differed as to whether the fellowship had had adequate didactic exposure. Most felt that a good deal of information was covered. Others thought certain areas should have been dealt with more specifically, such as speech evaluation. Some felt that the pace of the lectures had been too swift and had not allowed adequate time for learning. A number of physicians mentioned "housekeeping issues" such as distribution of reprints and the need for a training manual and bibliography (these were published shortly after the first training session).

A constant theme in these interviews was the trainees' desire for information regarding follow-up and management. This ranged from advice about medication to suggestions for dealing with school systems.

Most of the interviewees said their practices had changed. Some of their comments were:

- "I'm more interested in family diagnosis. I ask the kids to draw and write in my office"
- "I've gained an increased awareness of the contributions of disabilities to a situation that kids and parents aren't responsible for. I'm a more effective screener in my office"

- "I realized how inadequate I was. I'm handling more LD referrals now"
- "I'm generating more referrals for developmental problems. I'm much better able to use ancillaries (physical therapy, speech evaluations)"

The fellows enjoyed the school health site, and suggested ways to improve it:

- "very informational"
- "My view of being a school physician was changed dramatically"
- "should have been one day instead of two"

The educational needs of the trainees were varied. All agreed that information on development and behavior in the preschool and school years was essential, but this unanimity did not hold for infant and adolescent years. This was due, no doubt, to individual decisions regarding selection of patient populations.

The fellows also evaluated the program's faculty. Their comments were generally favorable, but several called for greater emphasis on certain subject matter.

All this information was studied as the one-month fellowship was planned. It was decided to allow as much individual choice as possible in organizing the trainee's schedules.

One concern of the project's staff was the fellows' mild interest in infant and toddler issues. This could be attributed to their "practicality bias", their desire to learn more about

managing the age group (6 to 13) that makes up most of their patient population. Since material regarding the 0 to 3 year old is essential for a full understanding of the entire developmental time-line, it was thought necessary to examine and improve the program's efforts in this area.

V. THE FUTURE

With the mini-fellowship in place and tested, it was decided to concentrate on training physicians from all around the country for one-month periods. Nurses and senior fellows from other programs would be included for the first time. The Bureau of Education for the Handicapped approved the first year of a new three-year grant for this purpose.

In planning the training program, it had become clear that three fundamental prototypes of pediatricians required individualized preparation:

Prototype A: This is the primary care physician who is a community-based generalist for whom developmental pediatrics is one of the large number of subspecialty areas with which he or she must be familiar. This prototype describes the largest group of community clinicians. It includes the pediatrician who has no special interest in developmental disabilities, but who needs to have enhanced knowledge as part of his or her general competence in child health.

Prototype B: This is the pediatrician who is a generalist in primary care practice but who has a special interest in the handicapped child and in developmental pediatrics. Such a person may work part-time in a school, institution, or community agency as a developmental pediatrics consultant. This individual may have a part-time commitment in a diagnostic clinic at a medical center

which entails teaching and out-patient care while serving as a mechanism for obtaining and sustaining skills and knowledge. Such a clinician may devote designated hours in a practice setting to special consultation with parents and children regarding educationally relevant developmental health problems. It should be emphasized that such pediatricians are spending most of their time in the practice of general pediatrics, with only a portion as consultants in the care of handicapped children.

Prototype C: Those fully involved in this area are the full-time specialists in developmental pediatrics. Such individuals are likely to be based in a medical center or child development unit. Other training sites may incorporate the full-time developmental pediatrician. This person is likely to be active in research, teaching, and service administration. The developmental pediatrician will have a great deal of responsibility for training the individuals described under Prototypes A and B, and will also be self-replicating in starting to develop future faculty.

During the initial year of our training program, it had become evident that there existed a major void with regard to the development of Prototype C, namely faculty. This was apparent at our national symposium, where it was observed that there was no core curriculum for pediatric development faculty. There was a notable dearth of medical personnel with a broad range of skills and a comprehensive knowledge base. The faculty members at our symposium were classifiable into categorical biases. There were those whose

background was in learning disabilities, while others were oriented exclusively toward mental retardation and multiply handicapped children. Some others were involved principally in the care of children with language disability and related sensory deficits. One such group was knowledgeable only in behavioral disorders. Few if any members of this assembled pediatric faculty had a broad perspective on the handicapped child coupled with more focused orientation.

There is a significant need for a faculty development effort to produce graduates who could constitute well-trained developmental trainers with a broad basic knowledge of the pediatric science relevant to handicapped children. Such individuals could be encouraged to proceed toward a specialized research and teaching focus, but would begin with a broad-based knowledge of developmental pediatrics.

In the first year of our new grant, we have begun to implement a replicable model of training for faculty in developmental pediatrics. In particular, we have designed and undertaken an initial core year prior to further subspecialization. The key to the success of this faculty development program will rest in its replicability.

The staff and the fellows themselves have been engaged in an intensive study of the problems of faculty development fellowship training. Each fellow in the first year of the program (just completed) was required to document carefully the content and perceived values of specific experiences. Each fellow was required

to pursue assigned readings and to rate their value for training purposes. There will be precise documentation of the content of the fellowship. Included will be a collection of case summaries kept by each fellow which may be used to document the range and intensity of the trainee's clinical experience. Each fellow will be given a detailed pre-test and post-test which will be criterion-referenced to document growth of knowledge and technical skills. It is the project's intent to develop a detailed training manual covering the introductory junior fellowship year in developmental pediatrics.

In the first year of our new grant, two faculty development fellows were trained. In addition, the mini-fellowship was continued and expanded as twelve physicians received training in developmental pediatrics over one-month periods. We are evaluating the performance of these individuals and hope to make our findings known shortly.

The training of medical personnel needs to be an active process. The passive absorption of instructional materials has never been a successful model in medical education. Emphasis needs to be placed on direct experience and appropriate instructional supervision and review. For this reason, it is inappropriate to plan pediatric training programs and curriculum materials without an in-depth consideration of the training sites and their experiential content. Experiences in such sites must be supplemented by reading materials, conferences, and other didactic techniques, and formal

teaching needs to be integrated with them. In attempting to develop a replicable training model, it is essential that we describe and evaluate the process of site design and development.

Since the beginning of our endeavor to train pediatricians in the care of the handicapped, it has been clear that non-medical center training sites are critical. As noted earlier, we have established a school health developmental training site in Melrose, Massachusetts. In this setting, our mini-fellows are exposed to educational interventions while learning to use the school health office as a pediatric consultation setting where medicine and education can have a particular fertile relationship. In the first year of our new grant, the training program has expanded into several day care sites in the greater Boston area. In these settings, the mini-fellows and faculty development fellows participate in on-site early prescreening programs. Neurodevelopmental and health screening of preschool children, both normal and "at risk", is taught to the fellows. Such sites are offered to all levels of training. On-site programs for screening for vision, hearing, lead levels, and developmental maturation have been established. The pre-post test for developmental fellows has been revised, and will continue to be updated to reflect new levels of knowledge in the field. Statistical studies of our trainees' performance on the examination are being performed.

We believe that a project which links together representatives of many disciplines should take advantage of this fact to produce

documents which can be used nationwide. Thus, at the very end of our original grant, a symposium was held on child health and education. Handicapped children require special care from two major service disciplines: education and medicine. Despite a common goal of fostering optimal development and well-being, the two often work in parallel with minimal communication, collaborative planning, joint management, and coordinated monitoring of progress. At its worst, widely divergent tracks of intervention can lead to mixed messages for parents of children, to misunderstandings about goals and objectives, to inconsistencies in care provision, to waste or duplication of services, and, ultimately, to adversary relationships between professionals.

There are explanations for the gulf between health care and education. In some communities, significant political issues foster alienation and necessitate independent actions. In others, health care professionals acknowledge rigid time constraints that limit communication, prevent attendance at critical meetings and, in general, discourage active collaboration. "Turf" issues between disciplines arise in certain cases. Mutual ignorance of the contents of each other's disciplines may engender improper service utilization and progressive frustration on both sides.

The symposium concerned itself with a major source of disciplinary isolationism: the problem of knowing how and what to ask each other. The exchange of information between education and medicine has been deficient. A multitude of relevant issues arise:

what are the most appropriate questions for educators to ask physicians about a child? What questions should a health provider pose to a school about a patient? Which questions will yield the most useful information? How can one classify or group these questions meaningfully? Are there certain types of questions that are more likely to lead to misunderstanding or to widen the gulf between disciplines?

In an effort to begin to enumerate, refine, and elaborate on "the relevant questions", a national symposium was held in Boston in May 1979. Participants included educators, psychologists, physicians, speech and language experts, nurses, and professionals from a number of other disciplines. The symposium was cosponsored by the Division of Ambulatory Pediatrics of The Children's Hospital Medical Center and the Bureau of Education for the Handicapped. The two-day meeting consisted of small study group sessions divided categorically. The six groups dealt with the following problem areas:

1. learning disabilities
2. behavior disorders associated with learning difficulties
3. neurological and motor problems
4. visual deficits
5. disorders of hearing and language
6. retardation and the multiply handicapped child.

The participants were asked to list and discuss the relevant questions with regard to diagnosis, medical treatment, and educational management of children within each of these categories of disability. Each subgroup reported on its relevant questions at

the full symposium session.

In preparing the proceedings entitled "Child Health and Education: A Compendium of the Relevant Questions", it was decided to meld the issues and extract common denominators from all six of the study groups. In this way, a non-categorically based system of relevant questions was arranged into 12 areas that transcend the categories of specific handicap. Specialized questions pertaining to only one type of disability were included in an area entitled "category-specific questions".

For example, here is a question that a school might ask the physician:

> At what rate can this child work?
>
> It is not likely that a physician will be able to help very much with this question. Day-to-day observations by teachers are more apt to yield usable information about a child's efficiency and capacity to work fast. On the other hand, a child's primary medical condition, certain medications, and neurodevelopmental status may have relevance to the rate at which a youngster can work. The physician may detect a generalized slowness of processing in a child which may corroborate findings in the school. Such conjoint observations may help the school to tailor its expectations.

The following is an example of a question that a school may be asked by a physician:

> What changes in behavior or performance have you observed in this child since implementation of the prescription?
>
> Medically prescribed routines or schedules, psychopharmaceuticals, dietetic restrictions, etc. may be indicated for youngsters. It is important that physicians and school personnel discuss the prescribed

regimens and share information about their efficacy. The physician may ask the teacher for observations on the effects upon the child's:

a) learning
b) attention span
c) alertness (wakefulness...fatigue)
d) peer relations
e) relations with adults
f) school attendance
g) general health
h) muscle tone
i) motor coordination (fine...gross)
j) self-esteem
k) mood
l) affect
m) appetite
n) sleep patterns
o) bowel habits
p) bladder habits
q) somatic complaints (headaches, stomach pains)
r) frequency of inappropriate behavior
s) speech
t) frequency of accidents
u) energy level/activity level
v) responsiveness
w) irritability

The appendix of this publication included checklists of the relevant questions to be used both by physicians and educators in the evaluation of individual children and a medical form developed by the project's staff for use in the Massachusetts public schools.

We will continue our investigation of the ways in which all levels of pediatric trainees may gain further information in the areas of child development and behavior. An essential question remains: that of payment for services. All the mini-fellows trained in our programs (all practicing physicians) received stipends of $1,000 for the time spent at Children's Hospital away from their practices. Whether a program of this sort could be offered by

various medical schools and hospitals around the country would be open to the question of reimbursement. Perhaps contracts could be established between the hospitals and day care centers or school health sites in which the services provided by staff and trainees could be paid for by these agencies. Various monies might go into a general reimbursement "pot" for the physician trainees. We remain convinced that an intensive and extended clinical experience is one of the best ways to impart knowledge in the field of child development. Correspondence courses or shorter three-day courses do not seem to be the answer for increasing the expertise of pediatricians in this area.

In all, significant progress has been made in understanding and closing the gaps in medical personnel's knowledge of developmental and educational handicaps. More will need to be done, but a sound foundation has been laid for continuing efforts.